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BERIBERI.

LOPEZ RIZAL (Leoncio). **Report of the Committee on Beriberi.**—*Jl. Philippine Islands Med. Assoc.* 1928. Oct. Vol. 8. No. 10. pp. 422–438.

Beriberi is a prevalent disease in the Philippines. In the year 1910 the mortality from the disease was 1,441 in Manila and 4,128 in the Provinces, while in 1926 there were 526 deaths in Manila and 18,678 in the Provinces. In 1926 a Committee was formed to deal with various aspects of beriberi following the recommendation of the Far Eastern Association of Tropical Medicine. The following are some of the more important of its findings.—The disease is widely distributed through the Islands, chiefly among the poorer classes, but the mortality varies greatly. It is prevalent during the last three months of the year and in January. Beriberi incidence and the local production of rice have both increased since 1910. Rices examined by staining with Gram's iodine solution having 50 per cent. or more of the external layer do not produce polyneuritis in pigeons, and such rices may prevent beriberi.

As regards the chemical standardization of rice it was found that amido-nitrogen is useless as an index; 1·05 per cent. ash is a poor index, 0·62 per cent. P_2O_5 content is better and 1·28 per cent. fat is the best. "Rice having 1·77 per cent. P_2O_5 plus fat but not less than 0·4 per cent. P_2O_5 content, or rice having not less than 0·62 per cent. P_2O_5, or rice having not less than 0·50 per cent. P_2O_5 and with at least 75 per cent. of the external layers, has been proven to be a beriberi-preventing rice for pigeons. These percentages excluded only 9 rices out of 200 that afforded protection to pigeons."

The chief causes of the deterioration of stored rice are damp and insects; undermilled rice deteriorates more rapidly than the overmilled variety. The different methods of preparing rice for food alter the P_2O_5 content and presumably the vitamin content also.

The diet of beriberi families investigated was found to be varied but insufficient owing to poverty.

Certain recommendations naturally suggest themselves as a result of these investigations. Chief among these are that the milling of rice should be carried out to the degree of safety mentioned above, that the growing of vitamin-rich vegetables should be encouraged and that the campaign of education in beriberi-preventive methods should be continued.

A. Douglas Bigland.

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SHATTUCK (George C.). **The Relation of Beri-Beri to Polyneuritis from Other Causes.**—*Amer. Jl. Trop. Med.* 1928. Nov. Vol. 8. No. 6. pp. 539–543. [10 refs.] [Harvard Med. School, Boston, Mass.]

It is not possible either in the laboratory or at the autopsy table to demonstrate a conclusive criterion of beriberi. Many cases, therefore, must be missed even by workers familiar with the disease. Where beriberi is endemic, polyneuritis may be due to other diseases such as diabetes, tuberculosis, cancer or syphilis. Even where the polyneuritis is associated with circulatory disorders and cardiac enlargement the diagnosis, though probable, is by no means certain. Such a polyneuritis occurring during the course of chronic malaria provides an example of the difficulty. Nevertheless the author is of the opinion that beriberi may be a " possible provisional diagnosis " whenever polyneuritis occurs in patients who have lived upon a restricted or unbalanced diet, or been subjected to marked debilitating influences.

Beriberi in the U.S.A. is apparently rare, but is seen occasionally in imported cases. The disease has been described in Louisiana, Newfoundland and among fishermen on the Grand Banks. One probable case has been reported in a coloured woman living in Philadelphia. Nevertheless a polyneuritis occurring in such conditions as chronic alcoholism, diabetes, cancer, tuberculosis, syphilis, pregnancy and the marasmus of infants may not be due to these conditions, but rather to an associated avitaminosis. In short, some might be cases of true beriberi. Arguments by analogy with pellagra are brought forward in support of this hypothesis.

" It seems reasonable to suspect the existence of beriberi wherever pellagra and scurvy are found, because all three diseases develop on a basis of faulty nutrition and because beriberi probably may be combined with either pellagra or scurvy."

A. D. B.

TRABAUD (J.). L'avitaminose suffit-elle à expliquer le béri-béri humain ? [**Does Avitaminosis explain Human Beriberi ?**]—*Bull. Acad. Méd.* 1929. Jan. 8. Year 93. 3rd Ser. Vol. 101. No. 1. pp. 47–51.

The author asks himself whether avitaminosis alone is sufficient to explain human beriberi. Apparently doubts upon this point occurred to him after observing cases of the disease during the war on the Italian Front and at Marseilles, together with those seen in Syria in 1924 and isolated cases which have since been noted in Damascus.

Particulars of the cases in Syria are as follows : From May to September, 1924, five cases of " dry " beriberi among Indo-Chinese Troops from Beyrouth were found. These men had been in the Levant for more than a year and had never suffered from the disease in their country of origin. Their food, though containing 550 grams of polished rice per day, was supplemented by bread, meat, green vegetables and fruit. Just at the time when the last two of these cases were recovering there were admitted to hospital (presumably at Damascus), 20 Senegalese in groups of four or five. These presented typical " wet " beriberi symptoms, and two died suddenly. Another Senegalee died suddenly in the Alexandretta Hospital of a similar condition and three other cases of like nature were evacuated to Aleppo. Cases were also observed in Tripoli.

It was found that all these Senegalese belonged to one reinforcement which had arrived some months previously. All had been recruited in the same district of the Soudan, where beriberi was unknown and the diet generous and varied, and not containing rice. During the journey to Marseilles (March to July) rice was the basal diet. On August 5th, less than a month after their arrival in Syria, beriberi broke out and attacked 50 per cent. of the troops. The author points out that at Dakar, at Marseilles and on the voyage to Syria and in Syria itself the diet had been sufficiently varied. Also, in the cases mentioned in the first part of this paper, though the diet contained 500–550 grams of rice per day, it was richly supplemented so that the ration was nearly equal to that of the white troops, as might be expected when living in a country noted for its fruits and vegetables, and in a garrison town where restaurants were plentiful.

The author further shows that during each year three or four sporadic cases of beriberi among black troops are admitted to the hospital at Damascus. The daily ration of these troops is given in a table and it is difficult to understand how avitaminosis could have occurred.

Reviewing all the cases it is admitted that rice does play a part in the causation of the disease since the condition began when rice was eaten, and when it was removed a cure was brought about. Nevertheless, it is suggested that the action of the rice is a toxic one, and the absence of fever in beriberi cases together with the similarity of the neuritis to that found associated with lead and alcohol are supposed to support this view. Avitaminosis may prepare the way for the action of the toxic substance.

A. D. B.

TULL (J. C.). **Gross and Histological Changes in the Gall-Bladder in Beriberi.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Nov. 25. Vol. 22. No. 3. pp. 285–287. With 2 figs. on 1 plate. [Path. Clinic, Singapore.]

This research is based upon a study of 270 autopsies on frank cases of beriberi occurring in Singapore. The gall bladder was constantly found to present certain appearances which may be regarded as typical of the disease. The organ appeared large, tense, glistening and of a distinctly yellowish green colour. Adhesions to the under surface of the liver were constantly present. On opening the gall bladder very little bile was found and the enlargement was seen to be due to thickening of the wall, in one case reaching half an inch. No gall stones were found.

The external surface of the gall bladder presented a honeycombed appearance and on section the layers shrank away from each other. The coats seemed to be separated by a coagulable gelatinous material most marked between the serous and muscular coats and in the serosa itself. Similar changes, though less marked, were found in the cystic duct and common bile duct and very much less in the hepatic ducts.

This oedematous condition of the gall bladder is met with even when no oedema occurs elsewhere in the body and is as characteristic of beriberi as are the cardiac changes.

Microscopically the presence of the amorphous gelatinous substance was noted, but there was no evidence of an acute inflammatory reaction and no organisms have been found constantly. The author has

discussed these findings with Professor WENCKEBACH of Vienna, and the conclusion is reached that the pathology is similar to that met with in the beriberi heart and is due to water retention.

A. D. B.

WENCKEBACH (K. F.) & AALSMEER (W. C.). **On the Nature of Cardiac Affection in Beriberi Patients.**—*Proc. Roy. Acad. Amsterdam.* 1928. Vol. 31. No. 6. pp. 656–659.

Certain points in the authors' well-known views upon the cardiac pathology of beriberi are again stressed. The typical features are increase in thickness of the cardiac wall, normal E.C.G. findings as regards excitability and conduction and the therapeutic failure of heart tonics as compared with the immediate good results from vitamin B administration.

Arguments are put forward in proof of the contention that the cardiac enlargement is not due to hypertrophy of the muscle, but to retention of water. Treatment must therefore be directed to the removal of this water retention. Digitalis might be expected to fail in this respect, but it is remarkable that diuretics such as novasurol and salyrgan have no effect. The wonderful and rapid improvement under vitamin B administration suggests that the muscular swelling is due to a specific cause. The probability is that the changes in the peripheral and central nervous system are due to the same cause, viz., water retention.

A short discussion of "heart hormones" and "automatins" is given and the paper terminates with these words regarding the therapy of the beriberi heart: "The added active substance should, therefore, not be called automatin; what takes place in the heart is not a resuscitation from the sleep of death, but the deliverance of a fettered prisoner."

A. D. B.

TUXFORD (A. S.). **Heart Failure in Beri-Beri.** [Correspondence.]—*Lancet.* 1928. Nov. 3. p. 948.

The writer of this letter expresses his whole-hearted agreement with Professor WENCKEBACH'S views as to the heart condition in beriberi [see this *Bulletin*, Vol. 25, pp. 871–2]. His experience in British North Borneo confirms the uselessness of digitalis as a heart tonic in these cases. The beneficial results obtained from daily large doses of magnesium sulphate point to the truth of the water retention hypothesis. He points out that this line of treatment together with one ounce doses of ordinary yeast three times a day and a diet in which the rice is mixed with green peas (katjang idjoe) and other vitamin B foods such as marmite, will make a beriberi case fit for work in three weeks. When fresh yeast cannot be obtained dry yeast spores in the form of pills may be given up to 30 grains daily.

A useful guide to the prognosis of a beriberi case is obtained from dynamometric measurements of the hand grip. On admission to hospital the grip does not usually exceed 30 kgm., but after treatment with yeast readings of 60 to 80 kgm. may be obtained at the end of a fortnight.

A. D. B.

YAMAGUCHI (Tomotaka). Studien ueber Flussigkeitsaustausch. VII. Intermediärer Flüssigkeitsanstausch bei Beriberi und experimenteller menschlicher B-Avitaminose. (Ein Beitrag zur Frage der Enstehungsweise des Beriberiödems.) [**Fluid Exchange in Beriberi and Human B Avitaminosis.**]—*Tohoku Jl. Experim. Med.* 1928. May 15. Vol. 10. No. 5. pp. 435–465. With 5 text figs.

Experiments were designed to show the effect of temporary pressure on the arm in cases of true beriberi. All three types of the disease, viz., the dropsical, the sensori-motor and the cardiac were examined, including also cases of experimental human B. avitaminosis. The experiments were conducted as follows : a rubber band was applied to the upper arm and after a quarter of an hour blood was removed from the constricted arm and also from the other for purposes of control. The control arm was then allowed to hang down vertically (apparently without a bandage) and blood was taken from it after half an hour. A bandage was then applied and after a further quarter of an hour another sample of blood was taken.

In true cases of beriberi the blood from the constricted arm after a quarter of an hour showed a drop in the haemoglobin content. The serum protein content was also lessened, but to a proportionately less extent. In venous stasis after half an hour both serum protein and haemoglobin content are increased, but the former to a less degree than the latter. After application of the bandage both drop below normal. In experimental B. avitaminosis cases the results were very much the same as those in sensori-motor beriberi (in the cardiac form of the disease the serum protein shows a continuous increase throughout the second experiment). The sodium chloride content of the blood remains the same during the whole time.

Congestion oedema in the arm is greater, and lasts longer and the capillary wall is more permeable to protein in cases of beriberi than in normal subjects.

From these experiments the author concludes that the oedema of beriberi is of non-renal origin and in all cases, whether oedema is present or not, the fluid exchange factors are pathologically changed and this phenomenon persists for some time even after recovery from all symptoms of the disease has taken place.

A. D. B.

MEGAW (J. W. D.), BHATTACHARJI (S. P.) & PAUL (B. K.). **Further Observations on the Epidemic Dropsy Form of Beri-Beri.**—*Indian Med. Gaz.* 1928. Aug. Vol. 63. No. 8. pp. 417–439. With 7 maps & 6 charts in text.

The paper is divided into two parts.

Part 1 comprises a review of the whole subject of epidemic dropsy and more particularly of the relationship between this condition and beriberi. While it is held by most workers that epidemic dropsy is a form of beriberi the latter condition is not a clinical entity, and, moreover, is as yet of unknown etiology. The neuritic type of beriberi is undoubtedly due to B avitaminosis, but the etiology of the cardiac and " wet " forms is by no means certain. Three main hypotheses have been put forward to explain the causation of both conditions,

viz., infection, food-poisoning, and vitamin deficiency. Other similarities between the two diseases may be summarized as follows: (1) Both are essentially diseases of rice eaters; (2) in India the geographical distribution of both dovetail into one another exactly; (3) the seasonal incidence of both is very similar; (4) the frequency of family and place outbreaks in both; (5) the age incidence (excepting infantile beriberi).

The differences between the two are: (1) Beriberi occurs chiefly among those who eat over-milled rice, while epidemic dropsy usually attacks those living on parboiled or under-milled rice; (2) Gastro-intestinal symptoms with fever and a vaso-motor rash are commoner in epidemic dropsy and neuritic signs in beriberi; (3) Glaucoma is frequent in the later stages of epidemic dropsy, but is not found in beriberi; (4) Epidemic dropsy has no infantile form.

Tables are given showing the relative frequence of the symptoms and the numerous etiological hypotheses.

Part 2. Contains many tables, charts and maps dealing with the various outbreaks of epidemic dropsy in Bengal during the period 1925 to 1927. Analysing the facts obtained from these epidemics the authors are of the opinion that the cause of the disease is the faulty storage of rice which renders the grain poisonous. Mustard oil cannot be blamed as a causative agent as this factor can be excluded in many cases. "It is impossible to believe that the disease could be caused by a deficiency of vitamin B; the explosiveness and the nature of the symptoms in themselves are enough to exclude this theory." The evidence is strongly against person-to-person infection.

Holding the view that epidemic dropsy is a disease due to poisons developing in rice owing to faulty storage the authors lay down the following two rules for the prevention of the disease:—

(1) "Epidemic dropsy can be controlled by the use of rice which has been properly stored at every stage after harvesting."

(2) "The diets of all persons should contain sufficient quantities of all the nutritional elements, including the necessary vitamins."

A. D. B.

GHOSH (G.). **An Outbreak of Epidemic Dropsy in Allahabad in 1927 (February to April).**—*Indian Med. Gaz.* 1928. Oct. Vol. 63. No. 10. pp. 562–565.

The Allahabad outbreak of epidemic dropsy began in February, 1927, with a few indigenous cases. Immediately the author warned the people in the local press to stop eating rice, particularly the parboiled milled variety. Nevertheless, the number of cases increased, reaching a maximum in April. By the end of May no further cases were reported.

The author's findings in this epidemic are as follows: Most of the cases occurred in Bengalese, a few were Anglo-Indians and Kashmiris, but all these were partial to rice. Those Bengalese who ceased taking rice, or changed to the local hand-milled variety, escaped the disease. The chief brunt of the epidemic fell upon those who bought rice from one particular grain market.

The age incidence of the disease varied from 8 to 65 years, and no babies or small children were affected. The most constant clinical features were gastro-intestinal disturbances, oedema (including effusions into serous cavities in a few cases) dilatation of the heart, the fatal

cases dying of cardiac failure with pronounced dyspnoea. Slight fever, haemorrhages from various organs, tenderness of the calf muscles and glaucoma (one case) were noted.

A. D. B.

KAMATH (A. V.). **Report on the Investigation of an Outbreak of Epidemic Dropsy in Surada, a Village in Ganjam District.**—*Indian Med. Gaz.* 1928. Oct. Vol. 63. No. 10. pp. 555–562.

Together with two other villages Surada forms the Union of Surada with a total population of about 4,000. An outbreak of epidemic dropsy occurred and attempts were made to ascertain when the disease first started in the village. According to a local midwife the disease began 19 years previously but the first official record dates from 1924 and a special report in 1925 recorded nine cases. Till recently the disease was practically confined to one street of the village and 75 per cent. of the cases in the present epidemic were traced to dhobi families in this street or to a woman and her son who kept an hotel near by.

The clinical findings include the following: Oedema of the legs, gastro-intestinal symptoms, fever in a few cases, dilatation of the heart in only three cases, anaemia and haemorrhages. The renal, nervous and respiratory systems showed no symptoms of note. The age incidence was apparently 4–60 years and the sexes were equally affected. The effects of the disease were slight in about 90 per cent. of the cases and work was not interrupted. A few mild cases cleared up in 15 days, but the more severe ones, with dysenteric diarrhoea and moderate oedema, lasted over four months. The average duration was about three months. Out of 102 cases six died.

Except for the poorness of the rice harvest in the year of the epidemic which necessitated the use of ragi gruel instead of rice gruel in the mornings there was no alteration in the diet of the village. For this and other reasons the author is opposed to the food deficiency theory of causation. The disease, in the majority of cases, was distinctly traced from one or two foci in the village and it would appear that some infective agent was present. It is not clear how the infection was spread. The water supply could not be blamed and the bed-bug was not the carrier. Food seemed to be the most important means of spread, but the nature of the infecting organism could not be determined. There is no immunity set up to the disease and, in fact, attacks are prone to occur in subsequent years in the same individuals. Treatment consisted of good nourishing food, disinfection of excreta, etc., and the exhibition of digitalis with potassium iodide.

The Editor of the *Indian Medical Gazette* appends a note in which he points out that many of the patients obtained diseased rice from a common source, and in the others, though home-grown rice was used, it is not clear whether this was the only variety eaten.

A. D. B.

FERRUCCIO (Cotta Ramusino). Contributo allo studio del beri-beri.—*Arch. Ital. Sci. Med. Colon.* 1928. Sept. Vol. 9. No. 9. pp. 551–559.

PELLAGRA.

GOLDBERGER (Joseph), WHEELER (G. A.), SYDENSTRICKER (Edgar) & KING (Wilford I.) & Others. **A Study of Endemic Pellagra in Some Cotton-Mill Villages of South Carolina. An Abstract.**—*Public Health Rep.* 1928. Oct. 12. Vol. 43. No. 41. pp. 2645–2647. [1 ref.]

Field investigations of pellagra were begun in South Carolina in the spring of 1916. Seven villages of the cotton-mill type were first observed, but throughout 1917 the number was increased to 24. Later again the number dropped to about the initial figure. The following results were obtained: During 1917, 1,147 cases of pellagra were observed, an incidence of 50·6 per 1,000 population. Of 4,104 households 18·5 per cent. had at least one member affected. The fatality rate of the endemic disease did not appear to exceed 3 per cent. It was also found that the disease in an endemic locality is from two to six times more prevalent than local medical opinion suggests. A preponderance of pellagra incidence was noted in children from 2–15 years of age. Single women were relatively exempt from the disease possibly owing to the fact that they are wage earners. 80–90 per cent. of all cases began between April and July (inclusive) and this can be correlated with seasonal variations in food supply. The continuous study of a selected village during a period of nearly six years demonstrated that year to year fluctuations of pellagra incidence are intimately associated with fluctuations in economic conditions. Sanitary conditions did not appear to influence the incidence of the disease.

A. Douglas Bigland.

DEARMAN (W. A.). **Pellagra.**—*Southern Med. Jl.* 1928. Sept. Vol. 21. No. 9. pp. 713–714.

This paper was read before the Gastro-enterology section of the Southern Medical Association, U.S.A., in November, 1927. The following points may be noted. Importance is attached to the role of unbalanced diet in the causation of pellagra. The disease is not on the increase in the Southern States and no fear need be entertained of an outbreak in the flooded area. A table is given showing that the proportion of pellagra cases in the black population as opposed to the white is approximately 2 : 1 and the proportion of deaths approximately 4 : 1. These differences are due to lack of intelligence and faulty hygiene in the negro population. The treatment of pellagra is reviewed and the importance of diet and vitamins is emphasized.

The paper ends with an extract from a letter written to the author by a medical colleague: " In the bright hereafter when all the benefits and all the beneficial agents of all the ages are gathered up and condensed into globules of transcendent ecstasy, I doubt whether there will be anything half so beneficial to the human race from the cradle to the grave as the grand old Jersey cow, America's greatest asset."

A. D. B.

MACHWILADSE (Niko). Ueber die Endemie der Pellagra in Georgien. [**Pellagra Endemic in Georgia (Caucasus).**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Jan. Vol. 33. No. 1. pp. 18–24. With 1 text fig. [11 refs.] [Med. Clinic, Georgia State Univ., Tiflis.]

During the years 1919–1925, 75 cases of pellagra were observed among the peasants living in villages of West Georgia (Caucasus). The age incidence of the disease was greatest between 30 and 45 years. Children were affected in some instances, but the disease was never seen in sucklings. Of the 75 cases 55 were males and 20 females. The condition was graded as 53 chronic, 17 sub-chronic and mild and 5 sub-chronic and severe. No cases of the acute type nor of pellagra without skin manifestations were observed. Exacerbations of the disease occurred as usual in the spring and many of the older patients said that their disease began in childhood.

The clinical appearances were characteristic, viz., dermatitis, diarrhoea, etc. In addition to the soreness of the tongue salivation was noticed in some instances and in one case 200–250 cc. of saliva were collected every day. There was no pyrexia, the blood pressure was low and in some cases, even in young subjects, emphysema was noticed. Examination of the nervous system revealed variability of the reflexes, weakness of the legs, and asynergia of the arms; in those cases investigated, the blood and spinal fluid were normal. The following mental changes were noted—weakness of memory, melancholia quite often, slowness in answering questions and dementia in two cases.

Laboratory investigations revealed in most instances a lessened total acidity of the gastric juice and achlorhydria. The chief change in the urine was an increase in volume and in eight cases diacetic acid was present. The stools contained parasites in 45 cases. The number of red blood corpuscles and the haemoglobin content of the blood were lessened, as also were the leucocytes and platelets. There was a relative lymphocytosis and the colour index was high. The viscosity was increased in all of the six cases examined; this may be accounted for by the fact that they all had diarrhoea. The fragility of the red corpuscles was found to be increased.

Georgia is a farming country, the eastern district of which is fertile and the people therefore prosperous. Here pellagra is very rare. But in the western district, along the coast of the Black Sea, the land is poor and the people live chiefly on maize bread and vegetables. The only fat is obtained from walnuts, while meat and milk products are rarely eaten. The maize is well stored and does not deterioriate.

The author summarizes his paper by stating that pellagra is endemic in Georgia and is practically confined to those districts in which food is deficient. The probable cause of the disease is a one-sided vegetable diet.

A. D. B.

v. POÓR (F.). Pellagrafälle in Südungarn. [**Pellagra in S. Hungary.**] —*Dermat. Woch.* 1928. May 5. Vol. 86. No. 18. pp. 600–604. With 2 text figs. [3 refs.] [Skin & V.D. Clinic, Franz Joseph Univ., Szegedin.]

The first case of pellagra in South Hungary was described in 1889. The disease must have been rare up to 1923 as the author never saw the condition prior to that date. In the next four years, however, some ten cases were recognized by him.

One case, having typical appearances, is described at some length and the others are said to be similar. Much attention is given to the skin lesions and one case showing an almost universal leucoderma is described. The only psychic disturbances noted were senile dementia and neurasthenia. With one exception the cases were found among the poorer classes.

As regards diet it appears that maize bread was eaten in the district during the war, but later ordinary bread was obtainable, and it was considerably after this that pellagra appeared. Also, maize bread is eaten in Budapest but no pellagra is reported in that city. The author finds no relationship between the disease and the consumption of alcohol. In his opinion unknown toxins, endogenous or exogenous, not associated with maize whether fresh or spoiled, sensitize the organism to the effects of light.

A. D. B.

CARLEY (Paul S.). **A Case of Pellagra following Voluntary Reduction of Diet.**—*Jl. Amer. Med. Assoc.* 1928. Sept. 22. Vol. 91. No. 12. p. 879.

A case of pellagra occurring in a white woman aged 33 is here described. The chief interest lies in the fact that the onset of the disease was closely associated with a period of voluntary and considerable reduction in her diet.

In 1921, when she was aged 27 years, indigestion was first experienced. This continued till the autumn of 1922 when she decided to restrict her diet. A cyst was removed from the ovary and the surgeon ordered a return to full diet with disappearance of the symptoms. In the latter part of 1926 the abdominal distress returned, and fearing carcinoma she again reduced her diet so that early in December, 1927, she was living largely on cooked cereals with no milk, vegetables, meat or eggs. About December 10th, 1927, she began to show signs of pellagra, viz., dermatitis of the hands and soreness of the tongue.

Treatment consisted first in reassuring the patient that she was not suffering from carcinoma, and secondly, in giving 1 lb. of canned tomatoes and 1 qt. of cow's milk daily in addition to an ordinary diet. Two ounces of dried brewer's yeast was taken in water (divided into three doses) daily.

Following this regime the dermatitis disappeared in 15 days, and by June 26th, 1928, the tongue condition had cleared up and she had gained 5 lbs. in weight. Her physical condition continued to improve and Dr. GOLDBERGER, seeing the case in July, 1928, could find no sign of pellagra.

A. D. B.

BALLIF (L.) & GHERSCOVICI (I.). Le pH du plasma sanguin et du liquide céphalorachidien dans la pellagre. [**The pH of Blood Plasma and C.S.F. in Pellagra.**]—*C.R. Soc. Biol.* 1928. Oct. 19. Vol. 99. No. 28. pp. 1187–1188. [5 refs.]

The pH values found in the blood and cerebro-spinal fluid in acute and chronic pellagra are here given. The method employed was the colorimetric one of Cullen and Guillaumin. The cases examined comprised 20 acute pellagrins, 10 chronic pellagrins and 30 mental cases as controls.

In acute cases of pellagra the plasma showed a pH value of 7·27 as compared with the figure 7·34 in chronic cases and controls. The alkaline reserve gave a figure of 49 for the acute cases, 54 for chronic and 60 for controls. In some cases showing a grave acidosis insulin (5–20 units a day) was administered without appreciable result. In spite of a high blood calcium figure all the cases presented extreme neuro-muscular excitability.

As regards the spinal fluid, difficulty was experienced since the normal figure is not agreed upon by all workers. In this paper a pH value of 7·21 is regarded as normal in the spinal fluid, with the alkaline reserve 46·22 and calcium 27. In severe cases of pellagra the fluid gave the values pH= 7·17, alkaline reserve 60, and calcium 37·1.

A. D. B.

Salmon (W. D.), Hays (I. M.) & Guerrant (N. B.). **Etiology of Dermatitis of Experimental Pellagra in Rats.**—*Jl. Infect. Dis.* 1928. Nov. Vol. 43. No. 5. pp. 426–441. With 8 text figs. [8 refs.] [Lab. of Animal Nutrition, Alabama Polytechnic Inst., Auburn, Ala.] [Summary appears also in *Bulletin of Hygiene.*]

In 1926 Goldberger and Lillie, by feeding rats upon a diet of casein, salt mixture, cod-liver oil, vegetable fat and corn-starch, supplemented by a vitamin B extract, were able to produce a pellagra-like condition. Later workers have obtained similar results. Having pointed out that the external signs of experimental pellagra in the rat are alopecia, dermatitis, stomatitis, ophthalmia, arthritis and usually cachexia, the authors summarize their work as follows :—

" The internal lesions of advanced cases are haemorrhagic gastro-enteritis, atrophy of the spleen, fatty infiltration or degeneration of the liver, cloudy swelling of the kidneys, and often cystitis. There is a relation between the character of the diet and the occurrence of the syndrome. A mild dermatitis has been found among mature rats receiving a diet which is adequate for excellent growth and reproduction. The severe form has been produced only on restricted diets.

" A gram-positive coccus has been found constantly associated with the disease. This organism has been isolated (often in pure culture) from skin lesions, arthritic lesions, parenchymatous organs, and walls of the intestines of pellagrous rats. With two exceptions the organism has not been obtained from the blood stream. The organism has been fed to rats and the characteristic lesions, from which the organism has been recover d, have been produced.

" Concentrates of a protective principle (P-P factor) which cure or prevent the occurrence of the disease have been prepared fro m Pueraria ra-bergiana [Leguminosae]. A relatively low concentration of these prepa tions in nutrient broth inhibits the growth of the causative organism."

A. D. B.

Huertas (Francisco). La pelagra.—*Siglo Méd.* 1928. Oct. 20. Year 75. Vol. 82. No. 3906. pp. 379–381.

Silva (Flaviano). Syndromo pellagroso.—*Ann. Brasileiros Dermat. e Syph.* 1928. Vol. 4. No. 2. pp. 13–17.

MALARIA.

CHRISTOPHERS (S. R.), SINTON (J. A.) & COVELL (G.). **How to do a Malaria Survey.**—*Health Bull. No. 14. Malaria Bureau No. 6.* Calcutta. 1928. pp. iv+147. With 11 plates. [As. 8 or 10d.]

A book of 150 pages, a price of 10d., and a quality of contents difficult to surpass. A malaria survey, it is noted, sets out to elucidate the facts in some particular place. It must form the first step in any campaign, and the criterion by which the effect of action taken is judged. It gives opportunity for constructive work on malaria epidemiology *based on precise measured data* and is perhaps what is most needed at present to widen knowledge. The paper gives a detailed list of the field apparatus and laboratory equipment in which one may trace the results of Christophers' long practical experience. To mapping, collection, and breeding-out and dissecting of anopheles the same applies. A valuable illustrated chapter deals with the structure of the ovary and development of the ova in the female anopheles, and shows how important differences in these may be in determining the insect's age, a matter needing further investigation; for apparently she will waste her eggs if she cannot reach her usual type of breeding place. For the spleen rate the ready use and correction of Christophers' standard charts (this *Bulletin*, Vol. 21, p. 597) are explained and their value in producing precise data made clear. In determining the parasite index too, Sinton's fowl-blood-corpuscle method of measuring the number of plasmodia in a given volume of blood is clearly described (this *Bulletin*, Vol. 22, p. 405), and can readily be carried through in the field. "It is nowadays considered essential, if possible, to carry out actual measured observations, so that the number of parasites per cmm. can be accurately determined. No one who has ever worked on this basis will ever return to unmeasured work." There are considered the protection of blood films in the field from dust and flies, the advantages of Giemsa's stain for tropical work, the differentiation and enumeration of parasites since the parasite rate has a meaning only in relation to a *known volume of blood examined*. There are sections on the collection and use of statistical data, on the study of physical features, and of meteorological and human conditions, eleven plates, and an appendix. Instances are given of four localities studied in India, in each of which the causation of malaria was entirely different, and it is noted how surprisingly often in a careful open-minded survey. some salient feature flashed out, characteristic and dominant. The importance in India of difficulties other than physical is such that the experienced malaria officer will recognize that what should be done will not be done, and will not add to these difficulties by failure to appreciate all the circumstances of the case. The book seems to illustrate two general principles, the very valuable work which is done in India, and the narrow outlook which insists on limiting much of its publication to India, so that even the influence of this *Bulletin* cannot give it the world value which it deserves.

Clayton Lane.

FEDERATED MALAY STATES. **The Malaria Research Division (Malaria Bureau).** [DOWDEN (R.), P.M.O.]—*Federated Malay States. Ann. Rep. Med. Dept. Year 1927.* Appendix B. pp. 58–62.

The accompanying table illustrates the very different picture of anopheles distribution obtained in the same place from larval catches

in rice fields and from capture of adults in adjacent houses. The former represent the collections per hundred dips with a dipper measuring 1,300 to 1,500 cc. Of 1,467 females dissected, only two were found infected, both being *A. aconitus*.

C. L.

TABLE.

Density of Anopheles larvae shown as "No. per 100 Dips."
Total No. of Dips 44,567. Total No. of Larvae caught 36,170.

Species.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
fuliginosus									
Larvae ...	62	70	51	43	37	15	9	10	
Adults ...	—	*4*	*11*	*11*	*1*	*1*	—	*2*	—
hyrcanus									
Larvae ...	20	26	31	29	24	8	11	10	12
Adults ...	*7*	*15*	*36*	*18*	*5*	—	*1*	*3*	*2*
barbirostris									
Larvae ...	11	19	29	22	21	14	11	10	12
Adults ...	*5*	*6*	*2*	—	*1*	*1*	*1*	*4*	—
aconitus ...									
Larvae ...	—	—	0·5	7.	12	21	3	5	5
Adults ...	*13*	*46*	*88*	*180*	*131*	*85*	*111*	*32*	*46*
kochi									
Larvae ...	—	—	—	—	0·2	0·7	2	—	—
Adults ...	*6*	*7*	—	*1*	—	—	*1*	*13*	*3*
vagus									
Larvae ...	—	—	—	—	—	0·1	1	—	0·1
Adults ...	*289*	*143*	*49*	*25*	*2*	*7*	*3*	*10*	*8*
maculatus									
Larvae ...	—	—	—	—	—	0·3	—	—	—
Adults ...	—	—	—	—	—	—	—	—	—
karwari ...									
Adults ...	—	*1*	—	—	*1*	-	—	—	—
Total									
Larvae ...	93	115	112	101	94	59	37	35	48
Adults ...	*320*	*222*	*186*	*235*	*141*	*94*	*117*	*64*	*59*

Rice Crop.	Planted out.	Growing.	Harvest.	Fallow.

ROBBINS (J. H.). **An Outbreak of Malaria among the Civilian Population of Olongapo, P.I.**—*U.S. Nav. Med. Bull.* 1928. Apr. Vol. 26. No. 2. pp. 451–461.

Robbins describes his experience in this station in the Philippine Islands and certain experiments with Paris green given partly floating and partly sunken to kill both surface and deep feeders. It seems to have been effective. A long editorial note deals with floating and sunken Paris green and with oil, and by inference corrects certain mistakes in nomenclature but adds some printers' errors. The use of *Ædes* for *Aëdes*, and of *A.* to indicate "*Ædes*" as well as *Anopheles* is confusing.

C. L.

Young (T. C. McCombie) & Baily (J. D.). **Malaria in Coorg.**—*Indian Jl. Med. Res.* 1928. Jan. Vol. 15. No. 3. pp. 745–795. With 12 charts, 2 folding maps & 2 figs. on 1 plate. [25 refs.]

Coorg, in Southern India on the Western Ghats, the smallest province in British India, with a population of about 175,000, must be classed as a hyperendemic area, has been so since 1870 at least, and suffers from blackwater fever. Its economic history is closely bound up with coffee but reasons are given for the conclusion that the vicissitudes of the estates have had no influence on malarial prevalence. The consumption of quinine, too, is no measure of malaria, but merely of the extent to which the drug has from time to time been made available. Local conditions are described and conclusions drawn so far as this was possible from a single short visit. A point of interest is that in opposition to advice by Hasell Wright in 1919 drainage was effected by open stone-pitched drains and larvae of *A. listoni* were found in these in large numbers, sheltering like trout behind stones and in miniature bays. Yet, in houses at whose doors this breeding was occurring, and whose inhabitants had a high spleen rate, adult anopheles were almost never found. Evidently the prolific vegetation provided them with a more congenial shelter. In two adjacent coffee estates spleen rates varied as 100 and 38 ; the coolie lines in the latter were on the top of a hill, in the former nearer a stream. There are no latrines on coffee estates and ankylostomiasis is judged to be rife. Time-occupying methods are given for determining the average position of the spleen's apex in different groups. Legends to chart and map are not to be accepted as they stand.

C. L.

Sergent (Edm. & Et.), Parrot (L.), Foley (H.) & Catanei (A.). La mesure du paludisme endémique. [**Measurement of Endemic Malaria.**]—*Arch. Inst. Pasteur d'Algérie.* 1928. Mar. Vol. 6. No. 1. pp. 1–13. With 1 text fig. [6 refs.] [Pasteur Inst., Algiers.]

Some eighteen years ago Ronald Ross laid down the principles which must underlie an effort to determine the malariousness of a particular locality. Neither the spleen index nor the parasite index suffices, but all cases in which parasites alone are detected, all cases in which enlarged spleen only is present and all in which both are present must be added together to give Ross's endemic index. When a choice must be made of a site for dwelling houses, it should be based on the endemic index.

Again Ross's mean splenic enlargement should be determined. The writers advise as the most convenient means of doing so that hypertrophy beyond the costal margin should be measured in finger breadths, 1 to 6, and that the number of spleens falling in each category should be multiplied by the corresponding number of finger breadths, the totals added and these divided by the total cases. Multiplying the spleen index by the mean splenic hypertrophy, there is reached the splenometric index, which gives a good pointer as to the effect of antimalarial work. Thus in Mitidja there was in April, 1924, a splenic index of 50·9 and in November after a quinine campaign one of 48·1 ; but the splenometric indices were respectively 213 and 110.

C. L.

Sergent (Edm. & Et.), Foley (H.), Parrot (L.) & Catanei (A.). Les principes de l'assainissement antipaludique. [**Principles of Antimalarial Sanitation.**]—*Arch. Inst. Pasteur d'Algérie.* 1928. Mar. Vol. 6. No. 1. pp. 14–17. [Pasteur Inst., Algiers.]

The principles cited, not all of world-wide application, form the following logical sequence. Defensive methods (quinine and screening) which protect the individual from infection are less effective than offensive measures against mosquitoes, for the numbers of these must as a first measure be reduced below a certain level by attack on their breeding-places. Useless water, stagnant and full of vegetation, breeds anopheles and must be suppressed. Useful water includes running water, deep water without vegetation, and soiled water—all of which do not breed anopheles ; and disciplined water which does if it stands for 15 days. To prevent this last stagnation is then the object of antilarval measures. When by these means adequate reduction of anopheles has been effected, plasmodia must be attacked : directly by quinine or some other equally effective drug, or indirectly by raising the standard of living and the level of resistance to infection.

C. L.

Foley (H.), Catanei (A.) & Giraud (A.). L'évolution du paludisme chez les enfants indigènes dans une région progressivement assainie par les mesures antipaludiques. [**Development of Malaria in Native Children in a Region rendered Progressively Healthy by Antimalarial Measures.**]—*Bull. Soc. Path. Exot.* 1928. Dec. 12. Vol. 21. No. 10. pp. 856–867. With 4 folding charts. [4 refs.] [Pasteur Inst., Algiers.]

In Beni Ounif-de-Figuig malaria was almost extinguished by 1914. By 1924, owing to relaxation of antimalarial measures due to the War, the splenic index was as high as 27·5 and the parasite index 61·5. Anopheles breeding was then entirely stopped, it is held, and quininization of part of the population was practised. The present investigation involved taking the axillary temperature morning and evening and a blood smear every morning for over a year of four infected children, three thick drops being examined daily by two observers. In one case the last parasitic find was six months after beginning observation, in a second five months, in the third plasmodia were found off and on throughout the period, and in the fourth the only positive examination occurred after the test had run for 13 months. In no case was any antimalarial treatment of any kind taken throughout.

C. L.

Neves (J. Silva) & Ornelas (A.). Indice endémico palustre da cidade de S. Paulo de Luanda. [**Malarial Index of Loanda.**]—*Bol. da Assist. Méd. aos Indigenas.* Loanda. 1928. Sept. & Oct. Vol. 2. Nos. 9 & 10. pp. 95–115 ; 155–177. With 2 charts, 1 folding map & 1 text fig. French summary pp. 177–181.

The capital of Portuguese West Africa has a population of nearly 23,000 and a spleen rate in 151 children of 38·4. 247 kgm. of quinine were distributed free in 19 months. Malaria has two peaks, April–May the higher, and November–December. The parasite index was about

70 per cent. in 236 examinations, *P. falciparum* being rather more frequent than *P. vivax*, and *P. malariae* absent. Anti-mosquito work does not seem to have been attempted.

C. L.

Leplae (Edm.). Malaria et culture de quinine au Congo Belge. [**Malaria and Cinchona Cultivation in Belgian Congo.**]—*Bull. Agric. Congo Belge.* 1928. June. Vol. 19. No. 2. pp. 295–332. With 1 map & 8 figs. [6 refs.]

The culture of cinchona, apart from the Dutch syndicate, constitutes the most interesting part of this paper. The Italian state has established at Tjibitoe, Java, a cinchona plantation which, when fully developed in 1937, will produce yearly 860,000 kgm. of dry bark or 40 tons of sulphate of quinine, nearly the full present Italian requirements. The development of a plantation at Kivu in the Congo is advocated.

C. L.

Chataway (J. H. H.). **Report on the Malaria Epidemic in the Lumbwa Reserve (August, 1928).**—*Kenya & East African Med. Jl.* 1928. Dec. Vol. 5. No. 9. pp. 303–309.

Unparalleled high temperature and drought were followed by an epidemic of subtertian malaria in the Lumbwa Reserve. In spite of doubts as to the reception the Lumbwa would accord to the proposal, arrangements were made through native distributors, each being given an identification card to be produced when applying for more quinine, a number of half ounce packets of quinine, a whisky bottle and a measuring spoon; an ounce of the suspension of one of the packets of quinine in a whisky bottle gave a less pleasing if more useful drink than the original and contained ten grains of the drug. By the end of a month over 57,000 doses had been distributed. The racial differences in resistance to ill-effects were marked. Imported Kavirondo labour, subject to infection for generations and from childhood, suffered little, whereas the recent extension of severe malaria to the Lumbwa was very fatal. Nevertheless, 3 responded to quinine after being comatose for 24 to 48 hours and one wife returned to an unenthusiastic husband after "her soul had departed three times during the night."

C. L.

i. Kligler (I. J.) & Reitler (R.). **Studies on Malaria in an Uncontrolled Hyperendemic Area (Hule, Palestine). I. The Seasonal Prevalence, Distribution and Intensity of Malaria in an Untreated Indigenous Population.**—*Jl. Preventive Med.* 1928. Sept. Vol. 2. No. 5. pp. 415–432. [6 refs.]

ii. — — & Liebman (E.). **II. Changes in the Resting Places of Anopheles with Special Reference to Infected Mosquitoes.** —*Ibid.* pp. 433–440. [5 refs.] [Dept. of Hyg., Hebrew Univ., Jerusalem.]

i. In this area the people are nearly all tent-dwelling Bedouins, highly infected with all three species of plasmodium and receiving little or no treatment. Highest infection is in the age group 5 to 9 years. It increases at all ages during epidemic seasons, so that immunity is relative only. The lowest and highest months of incidence are—for

P. falciparum February–June and November, for *P. vivax* November and June, for *P. malariae* August and February. The ratios of a sexual to sexual forms for the species are, respectively, 3 to 1, 2·5 to 1 and 1·5 to 1 ; in the first two only does the incidence of gametes correspond to intensity of infection. In designating splenic enlargement, category 1 is that palpable on ordinary respiration, 2 extends thence as far as two fingers from costal margin, 3 thence to umbilicus, 4 below umbilicus. In children blood infection and splenic enlargement ran parallel, but in adults this connexion did not hold for category 4. For the species, in *P. vivax* parallelism held, in *P. falciparum* the highest infection was with category 2. The blood index varied with the season, the spleen index holding constant through the year.

ii. In over 250 anopheles, of 145 taken in houses 69 per cent. contained human blood, 23 per cent. that of cows, 8 per cent. that of equines. Of *A. elutus* all infected specimens (5·4 per cent.) were found in houses from June to September. In October to December infection in those caught in stables was twice as high as in houses. Of *A. superpictus* a considerable number were found infected in stables throughout the year, but particularly during the summer epidemic period. These species of mosquitoes do not then stay where they have fed.

C. L.

i. Palestine. **Report on the Activities of the Malaria Survey Section, Government of Palestine, for 1927.**—*Palestine Ann. Rep. Dept. of Health for Year 1927.* Appendix I. pp. 75–79.

ii. ——. **Report of the Malaria Research Unit for 1927.**—*Ibid.* Appendix II. pp. 80–86.

i. The Malaria Survey Section, now reduced to an engineer director with such casual personnel as suffices for work undertaken, has reported on seven areas and has continued collection and study of Palestinian anopheles.

ii. Paris green has proved perfectly satisfactory for stagnant or nearly stagnant water ; in streams with a rock or gravel bed, paraffin and cresol mixture spray followed by scraping of the bed with a stiff brush proved useful. The long distance autumnal flights of anopheles have been confused with a simultaneous change of habitat from tents to stables and storerooms. *A. pharoensis,* previously considered a rarity in Palestine, was frequently found in 1927. The note contains much of local value.

C. L.

Maruaschwili (M.). Zur Frage der Neubesiedlung malariaverseuchter Gegenden in Georgien. [**Recolonization of Malarial Districts in Georgia (Caucasus).**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. May. Vol. 32. No. 5. pp. 236–243. [Trop. Diseases Inst., Tiflis.]

Owing to the general prevalence of endemic malaria recommendations regarding new settlements are that none should be built without a thorough medical survey especially of water conditions, that the lay-out and house plans should be approved, that there should be general blood examination and energetic treatment with isolation of the sick and a free issue of quinine for at least one year.

C. L.

Mazza (Salvador) & Rickard (E. R.). Investigaciones sobre las relaciones entre paludismo y cultivo del arroz en la provincia de Tucumán. Segundo informe preliminar. [**Relation between Malaria and Rice Cultivation in Tucuman.**]—*Prensa Méd. Argentina.* 1928. Oct. 30. Vol. 15. No. 15. pp. 651–654.

Observations between March 27th and April 20th, 1928, failed, except in one instance, to recover larvae of *A. pseudopunctipennis* in rice-fields. It is accordingly believed that rice culture should not be interfered with. It provides a summer crop where only the winter sugar cane is otherwise available, and so helps to cut the vicious circle malaria-poverty-malaria which would otherwise function continuously.

C. L.

Benarroch (Elías). Estudios relativos al paludismo. I. Investigación de los anofeles malariferos de Venezuela. 2. Persistencia y fluctuaciones de los gametocitos en la sangre periférica. Tesis presentada a la Universidad Central de Venezuela, para optar al título de Dr. en Ciencias Médicas. [**Studies in Malaria.**]—38 pp. With 4 text figs. [17 refs.] 1928. Caracas.

This thesis consists of two parts. In the first is given an account of the various species of Anopheles found in Venezuela, sixteen in all. Investigations were undertaken to decide which could be experimentally infected from patients with gametocytes in their peripheral blood, while many specimens of each were dissected in order to discover which were naturally infected. Only one, *A. albimanus*, was infected experimentally, but the attempts were too few for any conclusions to be drawn. Ten were found naturally infected, but two of them, namely, *A. apicimaculata* and *A. punctimaculata*, only once. The remaining eight were: *A. pseudopunctipennis*, *A. albimanus*, *A. tarsimaculatus*, *A. strodei*, *A. bachmanni*, *A. argyritarsis*, *A. albitarsis*, and *A. darlingi*.

The second part is a study of the fluctuations in the numbers of gametocytes found from day to day in the peripheral blood of 15 malarial subjects. These are presented in tabular form. It is noteworthy that in one patient, anaemic and debilitated by infection with *Necator americanus*, they persisted for 60 days or more in numbers as high as 60 crescents per 500 leucocytes.

H. Harold Scott.

Porto Rico Review of Public Health & Tropical Medicine. 1927. Dec. Vol. 3. No. 6. pp. 240–246; 1928. Jan. Vol. 3. No. 7. pp. 279–286; & Feb. No. 8. pp. 321–330.—**Report of Bureau of Malaria Control 1926-27. Parts I, II & III.**

Some local experiences of general interest are reported. Automatic tide gates are essential where, as here, much of the low land is only slightly above low tide level. Yet the large size of those here set up, necessary because of the large amount of water with which they deal, and their consequent weight, make them insensitive when the head of water is less than a foot. At the last of the ebb they have to be propped open. In mosquito control the aim is to *maintain* a low anopheles density in the controlled area. Less emphasis is now being laid on prolonged quinine administrations. The value of the local campaign is reflected in a parasite rate of O within the controlled area and one of

23 outside it (both in children with palpable spleens). The extraordinary patchy character of malaria infection is emphasized, highly infected and almost non-infected areas lying very close together.

C. L.

KEYWORTH (W. D.). **Severe Malaria among British Troops in the East African Campaign.**—*Proc. Roy. Soc. Med.* 1928. Dec. Vol. 22. No. 2. pp. 103–112. (War Sect. pp. 1–10). [12 refs.]; also in *Jl. Roy. Army Med. Corps.* 1929. Mar. Vol. 52. No. 3. pp. 175–188. [12 refs.]

Although East Africa was a subsidiary theatre of war 300,000 allied troops were employed there, and the sickness rate, mostly from malaria, was higher than in any other. The total admissions for malaria were estimated at about 250,000. Quinine prophylaxis was useless. Nets [probably narrow ones] were equally valueless. Laboratory facilities were ludicrously inadequate, far less effective than the equipment the Germans showed the writer after the armistice. A hurricane lantern, the simplest stains, and a night shift after his own 100 beds had been seen to, formed the writer's contribution to the diagnostic problem. Reticular appearance of the red cells forming the background of a thick-drop preparation is looked on as evidence of malaria, and the thick-drop proved invaluable. The amount of malaria pigment was sometimes very great. He arrived in East Africa completely prejudiced against intramuscular injection of quinine. He left it convinced that in field conditions in patients unable to take it by mouth it was the best route. Chemical sterilization (ten minutes in pure carbolic acid) was preferred where life of syringes and needles must be as long as possible. His experience suggested that to combine lumbar puncture with quinine administration in comatose cases was the method of election. [See, too, CORDES, in this *Bulletin*, Vol. 23, p. 544.]

C. L.

MANALANG (C.). **Notes on Malaria Transmission.**—*Philippine Jl. Sci.* 1928. Sept. Vol. 37. No. 1. pp. 123–131. With 10 figs. on 4 plates. [4 refs.]

Malaria transmission in the Philippines is by *A. minimus*, for only that species has hitherto been found infected, with an oocyst rate of 0·83 and a sporozoite rate of 0·35 in 2,283 females examined. Most catches were made by exposing the body in the open and using a flash light, the mosquito being held to be wild since it is seldom found in the ordinary "nipa" house even at night. The only catches in the day time have been of specimens imprisoned by wire screens. "During the period of heavy catches they have shown preferential harborage in two houses out of about seventy-five, and incidentally where most of the new malaria cases were registered." [Perhaps "significantly" would be a better adverb. The writer's wording is not always easy to understand.]

C. L.

WILLIAMSON (K. B.). **The Nitrogenous and Total Organic Content of the Soil in Relation to Malaria.**—*Malayan Med. Jl.* 1928. Dec. Vol. 3. No. 4. pp. 148–164. [18 refs.] [College of Med., Singapore.]

The higher incidence of malaria in hill valleys is generally correlated with a smaller nitrogen content in the soil, but not, so far as could be traced, with geological formation. When the nitrogen content of the soil rises to about 0·3 per cent. "approximate anopheline-sterility should result."

C. L.

RAO (G. R.). **Economic Significance of Malaria to an Industrial Concern: a Railway.**—*Indian Med. Gaz.* 1928. Oct. Vol. 63. No. 10. pp. 568–573. With 3 graphs in text. [3 refs.]

The writer considers the economic effect of malaria in the Lalmanirhat District of the Eastern Bengal Railway, the District. comprising 11 sections with varying degrees of malarial incidence. Grading the staff into pay groups and taking the number of days lost to the railway by malaria in each group [the method of diagnosis being presumably clinical] it is calculated that in this District alone the yearly loss to the railway from this infection is over Rs.30,000. Moreover, there is the loss by inefficiency due to mental worry when families of employees are seriously ill of malaria; regarding which Rao gives a striking instance where the disobedience of a signalman to an order given by a stationmaster, distracted by his wife's illness, saved from wreckage a goods and a mail train.

C. L.

CRAIG (Charles F.). **Malaria.**—*Arch. of Path.* 1928. Oct. Vol. 6. No. 4. pp. 645–723. [258 refs.] [Army Med. School, Washington, D.C.]

This detailed and valuable critical review of the present position of malaria cannot be abstracted.

C. L.

HANCE (J. B.). **On Malaria as an Independent Etiological Factor in Portal Cirrhosis.**—*Guy's Hosp. Reports.* 1928. Oct. Vol. 78. (Vol. 8. 4th Ser.) No. 4. pp. 379–407. With 1 fig. [18 refs.]

On the divided opinion as to whether malaria alone ever leads to a true cirrhosis of the liver, Hance gives details of twenty cases of the condition in which alcohol can be excluded in view of the short life span of a Mohammedan villager on the north-west frontier of India who might be even suspected by his fellows of such indulgence in any form. All twenty had had fever and 19 showed (the twentieth was not so examined) on spleen puncture, broken down malaria parasites or their pigment. In all, the spleen was enlarged while the liver might or might not be so. Microscopically in two patients who died the liver showed advanced chronic interstitial hepatitis with some pigment and columns of epithelium-like cells, possibly new bile ducts. Subtertian rings were present in a third of the cases in which they were looked for. "The whole picture is thus one of a series of cases of cirrhosis, identical

in the fatal cases in pathological and histological appearances, from which all usually accepted factors can be excluded, and in which every case showed positive evidence in history and spleen puncture of prolonged and intense malarial infection."

C. L.

PINTO (G. de Souza) & PINTO (S. Ferreira). Meios de avaliar a reducção de malaria apos a realização de uma campanha prophylactica. [**Estimation of Reduction of Malaria after an Antimalarial Campaign.**]—*Folha Med.* 1928. Oct. 5. Vol. 9. No. 28. pp. 332–333.

The writers found that antilarval measures, drainage and supplementary oiling had no effect on spleen or parasite indices, but brought down markedly the numbers of fever cases. They conclude that these last form the most exact measure of malaria, and that supposed relapses are really fresh infections.

C. L.

FERMI (Claudio). Sull'ombreggiamento antimalarico dei focolai anofeligeni. Terza nota preliminare. [**Shading as an Antimalarial Measure for Anopheline Areas.**]—*Malariologia.* 1929. Jan. 31. pp. 65–68. [3 refs.] [Hyg. Inst., Univ., Sassari.]

Fermi considers various trees by which shade can be obtained over rivers thus rendering them unsuitable for the breeding of local anopheles, their distance of planting, the filling-up of intervals between their trunks by bushy shrubs, the use of horizontal water plants for the same purpose, the cost of obtaining shade by such means as canes, aspens, poplars and elms, and the income they are likely to bring in.

C. L.

SAYERS (Edward G.). **Quartan Malaria in the British Solomon Islands: with a Preliminary Note on the Incidence of Different Types of Malaria.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Nov. 25. Vol. 22. No. 3. pp. 291–292. [Methodist Mission Hosp., Roviana, New Georgia.]

In 46 cases in which the " type " of plasmodium could be determined, the percentage distribution was tertian 63, subtertian 20, quartan 13, quartan and tertian 2, quartan and sub-tertian 2. Parasites were readily found in children, rarely in adults.

C. L.

PROUTE. [Bilan de l'effort antipaludique dans le secteur hydraulique de Barnaoul depuis 1921 à 1927.] [**Results of Antimalarial Measures at Barnaul from 1921 to 1927.**]—*Russian Jl. Trop. Med.* 1928. Vol. 6. No. 8. pp. 489–500. [In Russian. French summary p. 500.]

The percentages of the working men at Barnaul [? Western Siberia] who were malarious were 36 in 1921, and 67 in 1923. Registrationof sick and quininization were then introduced. From 1925 to 1927 the infection amounted to about 10 per cent. In roughly a thousand examinations infections with *P. vivax* fell in those years from 67 to 13, while those with *P. falciparum* were 11, 40 and 19. Similarly the parasite index fell from 8·3 to 3·2 and Ross's index from 1·62 to 1·14.

C. L.

Gastaminza (Ubaldo). Observaciones acerca del paludismo visto en el hospital de la Cruz Roja de villa Sanjurjo. (1928). [**Malaria seen in a Red Cross Hospital, Morocco.**]—*Medicina Paises Cálidos.* Madrid. 1929. Jan. Vol. 2. No. 1. pp. 56–64.

261 cases from the Rif were examined and 48 showed plasmodia, 33 being infected with *P. vivax* and 15 with *P. falciparum*. Six came under observation in February to April, 19 in May to August, and 23 in September to October. *P. vivax* predominated in the early months and *P. falciparum* later.

C. L.

Genoese (Giovanni) & Zallocco (Antonio). Gli edemi nella malaria dei bambini. [**Oedema in Malaria in Children.**]—*Pediatria.* 1928. Dec. 15. Vol. 36. No. 24. pp. 1309–1338. [Inst. Clin. Pediat., Univ., Rome.]

18 cases of oedema are reported in over 300 malaria-infected children. The condition is not uncommon in acute and is almost invariable in chronic cases. It may be fugitive, limited to the haemoclasic crisis, and is apt to accompany gastro-intestinal symptoms. Less important is oedema caused by malarial cardiac or renal lesions, by cachexia or by hydraemia. Rarely oedema takes the place of a malarial paroxysm.

C. L.

Duprey (A. B.). **Tropical Asthma.**—*Jl. Port-of-Spain Med. Soc.* 1927. pp. 116–120.

The writer is convinced from his experiences, some of which he mentions, that tropical asthma is in the main malarial, caused by the deposit in the lungs of malarial pigment, just as is that of the coal heaver by deposit of coal dust, and is curable in the early stages by quinine.

C. L.

Kirwan (E. W. O'G.). **Malaria as a Cause of Cataract.**—*Indian Med. Gaz.* 1928. Dec. Vol. 63. No. 12. pp. pp. 697–698.

From a large clinical experience in dark-room work in India the writer finds no fundus condition characteristic of malaria. He describes three cases in which he attributed cataract to that infection.

C. L.

Drenowsky (A. Kir.). Die Ergebnisse therapeutischer Versuche mit Plasmochin in bulgarischen Malariadörfern. [**Treatment Trials with Plasmochin in Bulgarian Villages.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Nov. Vol. 32. No. 11. pp. 575–580. With 1 text fig. [1 ref.]

Report is made on 209 patients, in about 20 per cent. of whom parasites were not found. Treatment was on lines advised by the makers of the drug. Its value is stressed in quinine resistant cases, which the writer evidently holds to be not uncommon, in blackwater fever, in pregnancy, in malarial diarrhoea of children and in quinine idiosyncrasy. It is held to have specific action on gametocytes, especially crescents, which were never seen in the blood after 3 days' treatment. There was very rapid shrinkage of the spleen. In many cases there appear in 4 or 5 days cyanosis, vomiting, diarrhoea and

colic, all disappearing within 2 or 3 days of stopping the drug. A plasmochin resistant strain of subtertian parasites is invoked as explaining the relapses following plasmochin and quinine treatment.

C. L.

HASSELMANN (C. M.) & HASSELMANN-KAHLERT (Margarete). **Notes on Plasmoquine (Plasmochin).**—*Philippine Jl. Sci.* 1928. Sept. Vol. 37. No. 1. pp. 75–121. With 1 text fig. [60 refs.]

This paper must be warily read. In testing plasmochin compound the tablets used were those of half normal size. The results obtained from 6 tablets daily were poor and, naturally, ill effects were not conspicuous; nevertheless, the dosage of plasmochin has been as high as 0·32 gm. daily instead of 0·06. It is stated erroneously that MÜHLENS has advised the use of these small tablets (this *Bulletin*, Vol. 25, p. 565) and has rescinded this decision. Indeed, the confusion which MANSON-BAHR warns against (p. 375) is all too excellently illustrated. Table headings speak of treatment by plasmochin irrespective of the use sometimes of plasmochin only and sometimes of plasmochin compound. Plasmochin (pure) was given normally to tertian cases in daily doses of 0·06 gm. continued till the day of discharge from hospital, so that its real curative effect seems not to have been tested. Apparently patients were expected to continue taking the drug after leaving hospital, since it is said of one, "after discharge from the hospital, the patient carelessly took too small an amount of plasmoquine compound and came back after four weeks not only with fever, loss of fifteen pounds, and headache, but also with a few crescents in the thick blood film. Crescents had never been found before." It is concluded that relapses are few compared with those following quinine, that the side effects (cyanosis, gastralgia) while never having required the discontinuance of the drug, yet make medical supervision absolutely indispensable, and that the drug is superior to quinine in tertian infection and specifically gametocidal in subtertian.

C. L.

HILL (Rolla B.) & BENARROCH (Elías). Tratamiento de los portadores de Gametocitos con plasmoquina. [**Treatment of Gametocyte Carriers with Plasmochin.**]—*Gac. Med. de Caracas.* 1928. July 31. Vol. 35. No. 14. pp. 209–211. [1 ref.] [Lab. of the Rockefeller Foundation & National Health, Maracay.]

The drug was given, either in simple or compound tablets, in daily dose of 0·06 gm., nominally in five 7-day series with 3 clear days interval between each, but actually only for two courses in 5 of the 15 cases tabulated. 7 do not seem to have been examined after the 17th day. In one case crescents appeared on the 29th day of treatment with simple plasmochin to the extent of 100 for every 500 leucocytes, and were still present on the 21st day of the compound treatment which followed.

C. L.

Bhattacharyya (Pasupati) & Chowdhury (S. P. Roy). **Plasmoquin in the Treatment of Malaria.**—*Indian Med. Gaz.* 1928. Nov. Vol. 63. No. 11. pp. 630–633.

25 cases are tabulated. It is specifically stated that "only the pure plasmochin tablets gr. $\frac{1}{3}$ each were used." Of Case 20 it is written, "He was given half a tablet of plasmoquin co. (plasmoquin g. $\frac{1}{2}$ + quinine gr. $\frac{1}{2}$) every 6 hours." The proportion to quinine shows that the dose of plasmochin was gr. $\frac{1}{24}$ and the total quantities of the drugs show that the halved tablet was of that special dosage since withdrawn under Mühlens' directions. (This *Bulletin*, Vol. 25, p. 565.) In one case plasmochin had to be replaced by quinine owing to violent abdominal cramps. "The patient was of marked neurotic temperament."

C. L.

Loreti (Francesco). La plasmochina nella terapia della malaria. Contributo clinico. [**Plasmochin in the Treatment of Malaria.**] —*Arch. Ital. Sci. Med. Colon.* 1928. Oct. Vol. 9. No. 10. pp. 585–606. [29 refs.] [Inst. of Trop. Path., Univ., Bologna.]

Plasmochin is hailed as a sovereign remedy for chronic malaria, which in the Bologna district is almost entirely due to *P. vivax*. The tablets actually used were of plasmochin compound. In one case at least administration began with three and ended with ten daily and comprised a total of 7·5 gm. of quinine and 0·5 gm. of plasmochin. This cited case and another acquired a double parotitis subsiding without fever. In general the parasites seem to have disappeared, though in not all were they apparently found at any time. In two they were abundantly present after a week's treatment. In no case was there cyanosis.

C. L.

Baermann (G.) & Smits (E.). Ueber Plasmochin. II. Mitteilung. [**Plasmochin. No. 2.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Jan. Vol. 33. No. 1. pp. 24–37. [Central Hosp., Petoemboekan, Sumatra.]

These writers review the plasmochin literature which includes records of 4 deaths and 11 severe intoxications. They conclude that when the drug is given alone in doses of 0·08 gm. daily for 17 to 20 days to a man of 50 kgm. relapse is rare in tertian malaria, but that doses of more than, and perhaps of, 0·001 gm. per kilo [presumably per day and so corresponding to 0·05 gm.] bring risk of intoxication. In doses of 0·012 gm. daily the effect on subtertian malaria is uncertain. When given with quinine, as plasmochin compound, in subtertian malaria the effect of 0·06 gm. and 0·15 gm. respectively [the latter should be 0·75 gm.] for 17 to 20 days is very satisfactory, though Olivier and Hulshoff found that in 7 per cent. of cases parasites reappeared. For double infections with tertian and subtertian malaria plasmochin is unsatisfactory; in its present form it is unsuited for mass treatment; in view of its grave or deadly effects in advocated doses, its administration demands the utmost vigilance, and it remains to be seen whether considerable reduction of dosage will reduce its curative power or eliminate its collateral ill-effects.

C. L.

HULSHOFF (A. A.). De behandeling van Malaria met Plasmochine en Chinine. [**Malaria Treatment with Plasmochin and Quinine.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1928. Vol. 68. No. 7. pp. 996–1001.

In a series of 149 cases of subtertian malaria the action of separately administered plasmochin and quinine was equal to that of plasmochinum compositum. The routine dosage was 3 times 0·02 gm. plasmochin and 3 times 0·2 gm. quinine per day during 20 consecutive days.

Three patients of the series died; in two the post-mortem examination showed the existence of sufficient other alterations to explain their deaths, in the third a fatty necrosis of the liver could possibly be attributed to plasmochin. Anyhow, it can be taken as a warning to be very careful with the drug, especially if there is any reason to believe in the pre-existence of liver damage.

W. J. Bais.

LICHTENSTEIN (A.). Over het gebruik van Plasmochinum bij Malaria. [**On the Use of Plasmochin in Malaria.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1928. Vol. 68. No. 7. pp. 1002–1009.

The author's own conclusions are the following:—

(1) Plasmochin is able to make disappear tertian schizonts and gametes, as well as subtertian gametes.

(2) In the cure with quinine as well as with plasmochin the fever usually subsides during the first two days, whilst the parasites disappear on the 3rd or 4th day.

In the author's series these results were somewhat more quickly attained with quinine than with plasmochin.

(3) Cyanosis during the plasmochin cure was only seen in cases of tertian fever.

(4) For the combating of malaria epidemics and for use in endemic centres plasmochin is not at present suitable.

W. J. Bais.

MARZINOWSKY (E. J.), PICKOUL (J. N.) & BALASCHEWA (M. T.). [Sur le traitement du paludisme par la plasmochine.] [**Plasmochin Treatment of Malaria.**]—*Russian Jl. Trop. Med.* 1928. Vol. 6. No. 8. pp. 477–481. [5 refs.] [In Russian. French summary p. 481.]

The writers were concerned with 72 cases representing all three species of plasmodium, *P. vivax* preponderating. Judging by 3 charts, the pure drug was given in doses of 0·1 gm. daily. The summary says that the plasmodicidal action of plasmochin is less than that of quinine and that the observations of the writers do not confirm the suggestion that it is specially gameticidal, while it produces collateral effect. It is useful in chronic cases and in those with quinine idiosyncrasy, and supplements this drug in the same manner as does methylene blue.

C. L.

DE BUEN (Sadi). Importancia de la plasmoquina y del quinetum en la lucha antipalúdica. [**Plasmochin and Quinetum in Malarial Treatment.**]—Reprinted from *Bol. Técnico Dirección General de Sanidad.* 1928. Dec. Year 3. No. 12. pp. 729–737. [3 refs.]

Having passed in review the reasons for desiring a drug other than quinine for treating malaria, de Buen tabulates the results obtained by him with quinine, quinetum or the total alkaloids, and plasmochin and quinine. Regarding the last, the administration to an adult consisted of plasmochin only, 0·06 gm. daily for ten days, quinine only in dose unstated in this paper for ten days, and again plasmochin only for ten days. The results regarding relapses were as follows :—

	Quinine.		Quinetum.		Plasmochin and quinine.	
	Children.	Adults.	Children.	Adults.	Children.	Adults.
Treated June to Dec. 1927 ...	35	8	15	13	26	15
Relapsed Jan. to April, 1928 ...	18	0	8	2	0	0
Relapsed percentage ...	51·4	0	53·3	15·4	0	0

Plasmochin had to be stopped on account of unwelcome symptoms in 14 per cent. of these cases ; for cyanosis in 8 per cent. ; for nervous symptoms, intestinal pain and trifling general disturbance each in 2 per cent.

C. L.

WALLACE (R. B.). **Plasmochin Compound in the Field.**—*Malayan Med. Jl.* 1928. Dec. Vol. 3. No. 4. pp. 145–147. With 4 figs. on 1 plate & 1 chart in text.

Malarious Tamils 500 in number were treated in hospital with plasmochin compound for 14 days followed by three weekly treatments of three days each. The amount given was 0·06 gm. plasmochin and 0·75 gm. quinine daily for the first 400 cases and two-thirds of those quantities for the last hundred. In reporting its effect on circulatory plasmodia, their species are not given, but the parasitifugal effects seem much as usual. No serious by-effects were noted, though " there were many cases of abdominal pain, sickness, vomiting, and headache, which, however, passed off on discontinuing the drug for a day or so." Haemoglobin increased, splenic enlargement lessened, pregnancy was not disturbed. As a prophylactic the drugs were given to 570 persons, the whole of one Division of the garden concerned, 0·02 gm. plasmochin and 0·25 gm. quinine for adults, at 5 a.m. and again at 4 p.m. for ten days (5th to 14th May). Oiling of larval breeding-places and hunting of the dwellings for adult mosquitoes also took place. The parasite rate fell between the first and the last day of treatment from 8·9 to 5·3 for men, from 10 to 0 for schoolgirls, was 7·1 and 7·1 for schoolboys and rose from 4·2 to 9 for working chokras. The " malaria rate " was on the first day 6·1, tenth day 3·8, sixteenth 1·8, twenty-seventh 4·6, and thirty-fourth 6·1.

C. L.

MANSON-BAHR (Philip). **The Therapeutic Action of Plasmoquine and Plasmoquine-Compound in Malaria.**—*Lancet.* 1928. Sept. 8. pp. 496–498. With 1 chart in text.

The history of plasmochin and what is disclosed of its chemical composition are sketched. They have already been dealt with in this *Bulletin*. Manson-Bahr about the end of 1927 discontinued giving plasmochin and substituted plasmochin-compound. He points out the confusion which has arisen by the varying composition of the latter tablet, but a further note seems needed. Their official composition has throughout been 0·01 gm. plasmochin and 0·125 gm. quinine, but the makers issued in addition another series of half that strength. This MÜHLENS suppressed in a paper in the *Deut. Med. Woch.* of 23rd December. 1927. Accordingly Manson-Bahr writes some nine months later: "It is necessary to be explicit about the dosage of plasmoquine-compound, as confusion is apt to arise on this point." He advocates the following dosage and adds that "it is necessary to follow this scheme closely in order to prevent relapses." For tertian and quartan malaria two tablets are given three times a day (six in all or 0·06 gm. plasmochin and 0·75 gm. quinine daily) for 7 days. Five such courses are necessary with intervals of 4 days between each, the treatment therefore covering 51 days. It is said that the number of tablets to be given daily in the second to the fifth courses is twelve, which would apply to the suppressed tablet. In a later issue of the *Lancet* it is pointed out in correction that the figure should be six.

Eighteen cases of tertian and eleven of subtertian malaria are reported. In each case parasites disappeared from the peripheral blood after an average dosage of 0·135 gm. of plasmochin and 1·687 gm. of quinine. On the tertian cases Manson-Bahr comments, "In one case only was a slight cyanosis observed after the sixth day of administration of the drug. The only other untoward symptoms noted were dyspepsia, occasionally abdominal pains, and, in one case only, dizziness. Subsequent experience has shown that these could be removed by glucose ʒi., given daily, either in powder or liquid form. As with pure plasmoquine, a rapid contraction in the size of the spleen took place and a corresponding clinical improvement in the condition of the patient was noticed." Two of the cases showed clinical relapses within six months. Of the eleven subtertian cases he writes, "In two cases, owing to the severity of the symptoms—vomiting and pyrexia—the action of plasmoquine-compound had to be reinforced by two intramuscular injections of quinine, grs. 5 each. Nevertheless, in three very severe cases the clinical improvement was striking and quite as satisfactory as after intensive quinine treatment." One quartan malaria, intractable under quinine for four years, became slightly cyanosed after a full course of plasmochin compound. "The clinical results, as far as could be ascertained, were satisfactory and no more relapses have occurred. The physical condition is satisfactory."

C. L.

ACHUNDOW (I.). Ueber Plasmochin-Nachweis im Urin. [**Detection of Plasmochin in Urine.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. July. Vol. 32. No. 7. pp. 347–351. [8 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

The author confirms the statement of SCHULEMANN, SCHÖNHÖFER and WINGLER (this *Bulletin*, Vol. 25, p. 568) that their chloranil test

will detect 1 part of plasmochin in 50,000 of urine, if applied to the latter directly, or 1 part in 2,000,000 if extraction by ether is resorted to. In the latter form the test was used in 19 cases of which 10 received plasmochin, 7 plasmochin compound and 2 quinine and gave positive results in 3, 6, and 0 cases respectively, leaving 8 cases in which, although plasmochin was taken the result of the test was completely negative. Possibly an even more delicate test is required to ensure detection of plasmochin excreted in urine, but it is possible that in these eight cases the normal absorption and excretion of plasmochin did not take place or the drug suffered change. In support of the latter view is the fact that in some patients cyanosis and body pains occur and that in two of these eight cases the disappearance of methaemoglobin from the blood synchronized with the reappearance of detectable plasmochin in the urine.

T. A. Henry.

Ashby (C. F.). **A Case of Plasmoquin Idiosyncrasy.**—*Malayan Med. Jl.* 1928. Dec. Vol. 3. No. 4. p. 148.

A European woman was admitted to hospital with a diagnosis of acute appendicitis and a history of nausea, some colic, severe bilious vomiting, fever of 100° and a pulse rate of 102, abdominal rigidity for which ⅓ gr. of morphia had been injected, and extreme cyanosis. Her condition showed good abdominal movement with " guarding " of the right lower quadrant and definite maximum tenderness over McBurney's point. Perspicacious questioning showed that she had taken plasmochin compound for three days, namely two, two and four tablets, which correspond to 0·04, 0·04 and 0·08 gm. in normal tablets. With the cessation of the drug she recovered in three days with an inviolate abdomen.

C. L.

Fischer (O.) & Rheindorf (G.). Zur Frage der Plasmochinnebenwirkungen. [**Secondary Effects of Plasmochin.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Dec. Vol. 32. No. 12. pp. 594–597. [7 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

Since it is established that doses of plasmochin of 0·08 to 0·1 gm. regularly produce haemoglobinaemia and often cyanosis, the writers set themselves to determine the significance of this change by injecting intramuscularly or giving by mouth 0·1 gm. of this drug and estimating haemoglobin and red corpuscles once or twice daily. They tabulate the results in two of " a number of patients," and conclude that if at the beginning of the treatment these conditions are normal they remain unaltered even if the appearance of cyanosis and abdominal pain have necessitated a temporary dropping of the remedy. If there is anaemia at the beginning, the haemoglobin and red corpuscles increase with the disappearance of parasites from the circulating blood, methaemoglobinuria was never observed and urobilinogen rapidly and permanently disappeared; evidence that there is neither blood destruction nor hepatic damage. [But no negative findings can cancel positive ones.]

C. L.

NAMIKAWA (Hiroshi). Ueber Intoxikationserscheinungen nach Plasmochindarreichung. [**Signs of Poisoning after Plasmochin Administration.**]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1928. Nov. No. 284. German summary p. 75. [In Japanese.] [Inst. Exper. Research, Formosa.]

In 25 cases of malaria treated with plasmochin, 9 suffered from toxic symptoms ; 3 tertian infections experienced hepatic pain, tachycardia, high fever and cyanosis ; 3 subtertian cases were seized suddenly on the 3rd or 6th day with blackwater-fever-like symptoms—jaundice, rigor, high fever and haemoglobinuria. The drug is not to be entrusted to the laity. From notes on charts in the Japanese text, the dosage of plasmochin was 0·06 gm. daily.

C. L.

MUFFEL (P. P.). Zur Frage ueber die gametenzerstörende Wirkung des Plasmochins. [**Destructive Effect of Plasmochin on Gametes.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Dec. Vol. 32. No. 12. pp. 605–607. With 1 text fig. [1 ref.]

A figure shows the progressive effect of plasmochin on those crescents which it destroys.

C. L.

LEISERMANN (L. I.). Plasmochin als ein wirksames antimalarisches Mittel. [**Plasmochin as an Antimalarial Remedy.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Dec. Vol. 32. No. 12. pp. 598–605. With 2 text figs. [24 refs.]

Study of 49 cases leads to the conclusion that plasmochin acts on all three forms of plasmodia including crescents, and is useful in quinine idiosyncrasy.

C. L.

LJACHOWETZKY (A. M.). [Die Behandlung der chronischen Malaria.] [**Treatment of Chronic Malaria.**]—*Russian Jl. Trop. Med.* 1927. Vol. 5. No. 4. In Russian pp. 202–204. [Summarized in *Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Nov. Vol. 32. No. 11. pp. 581–582.]

The writer considers 168 cases treated at the Moscow Tropical Institute, the percentages of malaria infections being with *P. vivax* 47 *P. falciparum* 26·7, *P. malariae* 6·6, mixed forms 19·7 and 69 others in whom no plasmodia were found. Almost exclusively the relapses occurred in the last group of infection. Almost all had had quinine and were therefore deemed resistant to it while 4 per cent. had an idiosyncrasy to the drug. These 237 cases were treated by two injections of 2 per cent. watery solution of methylene blue (10 cc.) on consecutive days and 4 hours later 0·3 to 0·45 gm. of neosalvarsan. The number of courses given and the number of patients receiving them were respectively 3, 18 ; 6, 66 ; 9, 67 ; 12, 38 ; 15, 19 ; 18, 12 ; 20 to 40, 17 or 2,391 courses of injection to 237 patients. The duration of treatment in months and the numbers of the treated were respectively ½, 52 ; 1, 100 ; 2, 68 ; 3, 7 ; 4, 10. Relapses were 7·5 per cent. within 2 to 4 months and 9·7 per cent. in all over a period of 3 years.

C. L.

Hunt (Reid), McCann (William S.), Rowntree (L. G.), Voegtlin (Carl) & Eggleston (Cary). **The Status of Intravenous Therapy. V. Limitations to the Use of Quinine intravenously in the Treatment of Malaria** [Maxcy (Kenneth F.)].—*Jl. Amer. Med. Assoc.* 1928. Nov. 3. Vol. 91. No. 18. pp. 1372–1375. [13 refs.]

A report prepared by Maxcy at the request of a committee whose names appear at the head of the article.

"There is little or no evidence to show that the therapeutic effect of quinine is secured by a direct action of the drug as such on the parasites in the red blood cells. It is probable that it acts indirectly by the formation of a decomposition product or by stimulation of some natural antibody, or through a combination of these. The intravenous injection of quinine does not possess any superiority per se over ordinary administration by mouth, and the method is not without danger to the patient. It should be reserved for those patients who present distinct clinical indications, particularly when oral administration is not practical for one reason or another. With proper precautions as regards technic, the dangers of the method may be largely obviated."

"Three cardinal principles should be observed :

" A. Careful aseptic technic.

" B. Administration of the drug in moderate doses and in dilution.

" C. Introduction of the solution into the blood stream slowly."

C. L.

Biginelli (P.). Perchè i prodotti chinacei del tipo euchinina sono antimalarici leggeri. (**On the Relative Therapeutic Efficacy in Malaria of some Drugs of the Type of Euquinine.**)—*Riv. di Malariologia.* 1928. Mar.–Apr. Vol. 7. No. 2. pp. 96–103. [English summary p. 213.] [General Directorate for Public Health, High School of Malariology, Rome.]

One of the most popular methods of avoiding the bitterness of quinine is to replace the hydrogen (H*) of the hydroxyl group of the alkaloid by the residue (R) of (1) an acid such as acetic, benzoic or salicylic, or (2) the half ester of a dibasic acid, such as ethyl hydrogen carbonate. This change can be represented thus :—

$$C_{10}H_8ON—CH.OH^*—C_9H_{14}N \rightarrow C_{10}H_8ON—CH.OR—C_9H_{14}N$$

One of the best known of these products is " euquinine " (ethyl quinine carbonate). They are in general so sparingly soluble that they can be described as " tasteless " and it is claimed for them that they retain the therapeutic properties of quinine unimpaired and do not exhibit the unpleasant secondary effects of this alkaloid. They are sometimes described as " salts of quinine," but are in reality esters of the alkaloid, and their use has been based on the assumption that in the body they are hydrolysed to the esterifying acid and quinine, the latter then exercising its normal effect. The author, however, points out that Gaglio and v. Noorden have shown that quinine given in the form of " euquinine " is only half as effective as when given in the form of quinine hydrochloride.

He has therefore conducted a number of experiments on the behaviour of " euquinine " and some of its analogues in presence of either warm dilute acid or mild alkali, representing acid or alkaline conditions possible in the body, and finds that they are only partially hydrolysed under acid conditions and not at all under alkaline conditions. They

are therefore all inferior to quinine itself; their relative therapeutic efficiencies depend on the facility with which they undergo hydrolysis to quinine in the body, and this naturally varies with the nature of the particular acid residue inserted in the quinine molecule.

T. A. Henry.

Sinton (J. A.), Bird (W.) & Eate (S. N.). **Studies in Malaria, with Special Reference to Treatment. Part VIII. The Oral Administration of Quinine-Stovarsol in the Treatment of Chronic Benign Tertian Malaria.**—*Indian Jl. Med. Res.* 1928. Jan. Vol. 15. No. 3. pp. 595–600. [7 refs.] [Quinine and Malaria Enquiry, Indian Research Fund Assoc.]

Two quinine-stovarsol preparations were tested by being given for 20 days, and the occurrence of relapse within 8 weeks was noted. After one preparation relapses followed in 10 of 12 or 13 cases, after the other in 6 of 10. In 4 control groups relapses under Sinton's quinine and citric acid mixture were 48 per cent. and in 3 other 62, 74 and 60·5 per cent. A provocative effect as shown by a severe febrile reaction was displayed by one of the preparations, so that the dose had to be lessened. The percentages of those showing splenic enlargement before, after 1 week's, and after 4 weeks' treatment, were: for the stovarsol groups (23) 39·1, 17·3 and 17·3, and for the quinine groups (108) 30·6, 10·2 and 7·4.

C. L.

Legendre (F. M. A.) & Mondain (A.). L'action du quinio-stovarsol sur les schizontes de *Plasmodium falciparum*. [**Action of Quinine Stovarsol on Schizonts of** *P. falciparum*.]—*Bull. Soc. Path. Exot.* 1928. Oct 10. Vol. 21. No. 8. pp. 625–629.

Quinine stovarsol was given by mouth in a ten-day course to 24 persons in whom a thick drop showed schizonts of *P. falciparum* and no other plasmodia of any kind. The dosage for an infant under one year was 0·25 gm., one to two years 0·375 gm., two to five years 0·5 gm., five to ten years 0·75 gm., ten years and over 1 gm. Tablets of 0·25 gm. were crushed and suspended in water. Disappearance of plasmodia was experienced. In only two cases was the observation period extended to as much as about a month.

C. L.

Lambert (L.). Action thérapeutique du quinio-stovarsol sur le *Plasmodium falciparum*. [**Therapeutic Action of Quinine-Stovarsol on** *P. falciparum*.]—*Bull. Soc. Path. Exot.* 1928. Nov. 14. Vol. 21. No. 9. pp. 760–761.

An infection with *Plasmodium falciparum* did not yield to "injection," presumably intramuscular, of quinine in a dose of 2 gm. daily. Eight days after beginning quinine-stovarsol, 1 gm. daily, no parasites, schizonts or gametocytes were found in the blood, and the man was 3 kgm. heavier.

C. L.

Sinton (J. A.), Bird (W.) & Orr (W. B. F.). **Studies in Malaria with Special Reference to Treatment. Part X. Quinine-Troposan in the Treatment of Chronic Benign Tertian Malaria.**—*Indian Jl. Med. Res.* 1928. Oct. Vol. 16. No. 2. pp. 333–339. [5 refs.]

Quinine-troposan was administered in tablets of 0·25 gm. each containing 50 per cent. quinine and 40 per cent. troposan, the total dosage being 21 and 16·8 gm. and the daily dose either 6 tablets for 28 days, or 9 for 14 days and 6 for 7 days. The relapse rate for the first series was 55 (10 of 19) and for the second 42 (14 of 38).* In 22 plasmoquine cases (0·08 gm. daily for 28 days) it was 22 ; in 20 plasmoquine compound cases (0·1 gm. plasmoquine and 1·25 gm. quinine daily for 28 days) it was probably 0. Splenic enlargement was less reduced than with other drugs. Prophylactic measures should always be taken against chance of arsenical poisoning.

C. L.

Puyal (J.) ; Navarro-Martín (A.) ; Alvarez-Cienfuegos (J. M.). El dimetilarsinato de quinina en el paludismo agudo y cronico. [**Dimethylarsenate of Quinine in Acute and Chronic Malaria.**]—*Medicina Países Cálidos.* Madrid. 1928. Nov. Vol. 1. No. 6. pp. 546–549. [1 ref.]

Dimethylarsenate of quinine has the formula $[C_{20}H_{24}N_2O_2]$. $HOAsO(CH_3)_2$. From experiments on rabbits it is concluded that the maximum intravenous dose must be less than 0·18 gm. per kilo, and should be not more than 0·075 gm. per kilo, or 1:5 cc. of a 5 per cent. solution given intravenously and 1·5 cc. intramuscularly. The maximum dose administered to patients has been 0·1 gm. for a person of over 50 kilos. Three cases are reported in which two or three injections were given varying from 0·5 to 2 cc. of a 5 per cent. solution, with disappearance of all parasites from the skin blood.

C. L.

Green (Richard). **The Treatment of Malaria with Aseplene.**—*Bull. Inst. Med. Res. Federated Malay States.* 1928. No. 3. 4 pp. With 20 charts.

Aseplene is a proprietary preparation made in London and widely advertised in Malaya and Siam. Its accompanying literature states that there will be practically no more fever after the first 48 hours of its administration, that the malaria parasites are killed by the action of " aseplene " without injury to other cells of the body, and that " there has not been a single failure in successfully treating malaria, even in the most chronic state." It is a reddish-brown fluid with a pungent smell and a taste suggesting formalin.

Tests showed that during its administration haemoglobin fell, spleen enlarged, plasmodia persisted and generally increased in numbers, and that the fever was uninfluenced. " The condemnation of the use of quinine in the treatment of malaria, contained in the advertisement

* These are " possible maximum " rates, rather higher than the " observed minimum " rates ; the difference is due to the observations of some patients being incomplete.

for aseplene, is unjustified and dangerous. . . . From the results observed in the ten cases reported it may be definitely concluded that aseplene is of no value in the immediate treatment of malaria."

C. L.

Ballif (L.) & Lunevski. Inoculation expérimentale de la malaria par voie intrarachidienne. [**Intraspinal Injection of Malaria.**]—*C.R. Soc. Biol.* 1928. Oct. 19. Vol. 99. No. 28. p. 1178.

After abstraction of 2 to 3 cc. of cerebrospinal fluid, 0·5 to 1 cc. of blood containing *P. vivax* was injected into the sac. There was headache with temperature up to 38·5° for 2 to 5 days. Later, malaria parasites established themselves, in all respects normally, in the peripheral blood. That is, they passed readily out of the cerebrospinal fluid into the general circulation. The effects on the nervous system did not differ from those which follow subcutaneous or intravenous injection of malarial blood.

C. L.

Sinton (J. A.), Orr (W. B. F.) & Ahmad (Bashir). **Some Physico-Chemical Changes in the Blood, produced by the Malarial Paroxysm.**—*Indian Jl. Med. Res.* 1928. Oct. Vol. 16. No. 2. pp. 341–345. [16 refs.]

Twenty cases were examined, but only 7 of these during a rigor. Blood was drawn from a vein. The surface tension of the blood nearly always fell during the rigor. In 4 persons tested for refractive index, this rose in 3 and fell in 1. Bilirubin rose during the paroxysm. The conditions which were found resemble those of anaphylactic shock and add to the evidence that the rigor is an expression of this condition.

C. L.

Ratcliffe (Herbert L.). **The Relation of *Plasmodium falciparum* to the Human Red Blood Cell as determined by Sections.**—*Amer. Jl. Trop. Med.* 1928. Nov. Vol. 8. No. 6. pp. 559–562. With 11 figs. [5 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore, Md.]

In this *Bulletin*, vol. 25, p. 574, was published an illustrated abstract showing that *P. vivax* and *P. praecox* [properly so termed, the bird parasite] are intracellular. Ratcliffe has now given similar pictorial evidence that the same holds for *P. falciparum*, which he summarizes as follows. " Placental tissues from a person infected with *Plasmodium falciparum* was fixed in Bouin's fluid, dehydrated, and embedded in paraffin. Sections 2μ in thickness were cut, and stained in Harris's hematoxylin. The parasites have been found invariably to be intracellular."

C. L.

Row (R.). Observations sur le paludisme et la formation des gamètes de plasmodium en cultures. [**Observations on Malaria and the Formation of Gametes in Cultures.**]—*Bull. Soc. Path. Exot.* 1928. Oct. 10. Vol. 21. No. 8. pp. 607–610. With 4 figs. on 2 plates. [1 ref.]

This paper consists of a series of statements regarding the development of plasmodia based on their study in cultures. The number of

merozoits formed depends not merely on the species. It varies with the vigour of the parasitic race, with the intensity of parasitism, and particularly with the interval since infection. In a first attack there are many merozoits. In subsequent ones they become fewer until only one is produced, and at that precise moment gametes begin to be formed. Outside the infected corpuscle leucocytes wait patiently, and pounce on and devour the extruded spores, those that escape being often dissolved in the serum. Development is poor in anaemic blood. Spontaneous cure implies the formation of antibodies, and crescents can be destroyed *in vitro* by a vaccine. Excellent composite photomicrographs accompany the paper. [The observation that *in vivo* gametocytes of *P. vivax* may be among the first forms to appear (Yorke and Macfie) suggests hesitation in applying to natural infections these *in vitro* conclusions.]

C. L.

Reitler (Rudolf). Ueber eine Varietat des Quartanaparasiten. [**A Variety of Quartan Parasites.**]—*Arch. f Schiffs- u. Trop.-Hyg.* 1929. Feb. Vol. 33. No. 2. pp. 93–95. With 1 text fig. [2 refs.] [Dept. of Hyg., Hebrew Univ., Jerusalem.]

In three Arab children of ages between one and five in the Hule district of Upper Galilee Reitler found malaria parasites with unusual characters. Rings show marked granular chromatin throughout the parasite. Larger forms tend to be banded, yet differently so from quartan forms. Finally pigment granules pervade the whole cell, but are apt to become aggregated in certain spots. Merozoits number ten to twelve. Pigment is finer than is usual in *P. malariae* but perhaps somewhat coarser than in *P. vivax*. Pigment is very fine in the microgamete, very coarse in the macrogamete. Infected corpuscles are not enlarged and are somewhat decolourized, without Schüffner's or Maurer's dots.

C. L.

Bacchelli (Giulio). Sulla possibile trasmissione del *Plasmodium* della malaria umana negli animali. [**Attempts to transmit Human Malaria to Animals.**]—*Arch. Ital. Sci. Med. Colon.* 1928. Nov. Vol. 9. No. 11. pp. 676–684. [6 refs.] [Inst. of Trop. Path., Univ., Bologna.]

Two monkeys, two pigs, six guineapigs, two white rats and two white mice were inoculated subcutaneously, intramuscularly, or intraperitoneally with blood containing *P. vivax*, and two white rats, two white mice, six guineapigs, two monkeys and two pigs with blood containing *P. malariae*. Blood was either citrated or untreated. No infection followed.

C. L.

Massa (Mario). Remote e recenti ricerche sulla deviazione del complemento nei malarici. [**Complement Deviation in Malaria.**]—*Pathologica.* 1929. Jan. 15. Vol. 21. No. 447. pp. 18–23. [15 refs.] [Path. Inst., Univ., Catania.]

Antigen was made from a placenta containing *P. falciparum* from a woman who had recently had a malarial access. Deviation occurred in half of 25 cases held to be malarial. It was positive in 4 of 8 of them who did not show plasmodia, and negative in " primitive " malaria and in those showing gametes only. The action was not specific and

was intensified by preliminary elimination of haemolytic amboceptor; and there was no parallelism between the intensity of reaction and the clinical importance of infection.

C. L.

i. Henry (A. F. X.). 1° contribution à l'étude sérologique de l'infection palustre. 2° sérothérapie anti-pneumococcique avec saignée préalable dans la pneumococcie chez les paludéens. [**Serological Study of Malaria.**] Rapport présenté au Congrès de Constantine de l'*Association Française pour l'Avancement des Sciences*. 9 pp.

ii. ——. Etude sérologique de l'infection palustre.—*Paris Méd.* 1928. June 23. 7 pp.

iii. Le Bourdelles (B.) & Liégeois (R.). Contribution à l'étude de la réaction de Henry (ferro- et mélano-floculation); sa valeur dans le diagnostic de l'infection palustre.—*C.R. Soc. Biol.* 1928. May 18. Vol. 98. No. 15. pp. 1342–1344. [2 refs.]

iv. Henry (A. F. X.). A propos de la sérologie de l'infection palustre.—*Ibid.* Sept. 18. Vol. 99. No. 26. pp. 819–821. [1 ref.]

i and ii. Henry describes certain serological tests for malaria.

Ferroflocculation. 2 per cent. Bouty solution, preserved on ice, is diluted 1 in 6 and 1 in 12 in distilled water thus giving dilutions of metharfer of 1 in 300 and 1 in 600. To each dilution [the quantities seem unstated] add 0·2 cc. of clear untreated serum, shake, incubate at 37° C. for 1½ hours. Remove to room temperature for half an hour. Read two hours later neglecting doubtful flocculations. All 58 malaria cases actually infected gave the reaction. Sera of 85 suffering from other diseases did not.

Melanin from the choroid and vitreous of bullocks' eyes, with distilled water and formalin added, is suspended and diluted, and to this serum is added. Malaria serum produces flocculation and deviation of complement.

iii. Le Bourdelles & Liégeois failed to confirm these findings.

iv. Henry believes that the mode of preparation of choroidal pigment used by these writers is not his own. There seems also to be difficulty in distinguishing a true flocculation from a false one.

C. L.

Row (R.). **A Simplified Technique for culturing Malarial Parasites Aerobically.**—*Indian Med. Gaz.* 1928. Nov. Vol. 63. No. 11. pp. 628–630. With 3 text figs. [4 refs.]

Growth has occurred readily at laboratory temperature in Bombay, 87° F. to 90° F., using the writer's technique (this *Bulletin*, Vol. 10, p. 169). The essential requisites are a flat-bottomed microculture tube, and glucose in the serum. According to the paper 3 or 4 drops of blood are defibrinated by shaking in a test tube and a drop or two introduced into each of a series of culture tubes charged with half an inch of glucosed serum, so that the corpuscles lie in open formation the better to develop. The deposit is ready for examination in 12 to 24 hours or more.

C. L.

Robinson (Florence E.). **A Note on an Abnormal Colour Development in the Fouchet Reaction.**—*Jl. Med. Assoc. South Africa.* 1928. Dec. 22. Vol. 2. No. 24. p. 667.

If a patient be injected with N.A.B. and a sample of blood be withdrawn into the same syringe, the serum will give with the Fouchet

reagent a violet red instead of the green colour of bilirubinaemia. Blood withdrawn into a clean syringe from the other arm does not. The reaction occurs in dilutions up to 1 in 8,000 in saline and 1 in 5,000 in citrated or oxalated plasma. "A combination of diagnostic and therapeutic procedure may seriously affect the value of the diagnostic test."

C. L.

OWEN (D. Uvedale). **Observations on the Output of Urobilinogen in Malaria and the Influence of Quinine upon it.**—*Ann. Trop. Med. & Parasit.* 1928. Dec. 28. Vol. 22. No. 4. pp. 461–502. With 20 figs. [40 refs.] [Liverpool School of Trop. Med., Liverpool.]

This very detailed work is, with the exception of that of WALLACE and DIAMOND (1925, *Arch. Intern. Med.*, Vol. 35, p. 699), the only one in which urobilinogen in malaria has been quantitatively estimated. The writer's summary is as follows :—

"1. Urobilinogen is present in normal urines. Its output varies from hour to hour and from day to day in the same individual; it is usually present in greater concentration in afternoon than in morning or evening specimens.

"2. Cases with parasites of quartan, simple tertian or malignant tertian malaria in the blood may pass urine free from urobilinogen.

"3. No excess of urobilinogen may be found for prolonged periods in quartan and simple tertian malaria, during which the patients may have severe malarial paroxysms.

"4. It was found in greatest excess in malignant tertian malaria, particularly cerebral malaria.

"5. The output bears no relationship to pyrexia.

"6. The output bears no relationship to the degree of splenic enlargement.

"7. Urobilinogen may be present in excess in splenectomised malarial patients.

"8. Quinine increases the output in simple tertian malaria and malignant tertian malaria. Sufficient observations were not made in cases of quartan malaria, but out of four cases observed an increase was found in two.

"9. Quinine may increase the output in malignant tertian malaria in the absence of the spleen."

C. L.

HECHT-ELEDA (Margot). Zur Impfmalaria der Syphilis. (Ueber den Einfluss der klimatischen Verhältnisse und Blutgruppen auf die Inkubationsdauer der Impfmalaria bei Luetikern.) [**Influence of Climate and Blood Groups on the Incubation of Inoculation Malaria.**] —*Arch. f. Dermat. u. Syph.* 1928. Aug. 21. Vol. 156. No. 2. pp. 377–382. With 4 text figs. [12 refs.] [Dermat. & Syph. Clinic, Univ., Vienna.]

The subtitle describes exactly the scope of the paper. The material consists of 170 syphilitic patients studied over 3 years. The average incubation period for intravenous injection, which alone was used, was 4 to 5 days in June and July when the average mean temperatures were about 18° C.; while it was 7 days in October, November and December when the temperatures were 10° C., 6° C. and 0·5° C. About the same difference was noted between compatible and incompatible blood

groups. No other factors appeared to have any influence. The best way then of obtaining infection by injection, if choice be possible, is to inject in the summer and to use compatible blood.

C. L.

Vallejo Najera (A.). Algunas observaciones clinicas acerca del paludismo terapeutico. [**Clinical Notes on Therapeutic Malaria.**]—*Med. Países Cálidos.* Madrid. 1928. July. Vol. 1. No. 4. pp. 339–355. With 7 charts in text. [2 refs.] French summary p. 355.

Although this strain of *P. vivax*, carried by injection, disappeared spontaneously by failing to infect, it caused a 6 per cent. mortality in 130 cases, one death being from hyperpyrexia. 10 per cent. had pernicious symptoms, among them choleraic. The writer was well aware of the risk of contamination with *P. falciparum*. Gametocytes were never observed. The other conditions were as usual.

C. L.

Keining (E.) & Serefis (S.). Biologische Studien bei Impfmalaria. [**Biological Studies in Inoculation Malaria.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Feb. Vol. 33. No. 2. pp. 95–104. [1 ref.] [Skin Clinic, Univ., Hamburg.]

141 cases are considered, comprising 47 generations of injected malaria, nearly always intravenously effected in quantities of 2·5 to 5 cc. A curious feature was the way in which groups of purely tertian manifestations alternated with other groups in which fever was tertian and quotidian. Each group contained some 10–25 cases. The alternation could not be associated with age, sex, season, or stage of the mental disease and merits further investigation. None of the means employed could be made to affect the length of the incubation period.

C. L.

Kruspe (M.). Unsere Erfahrungen mit Malaria und Saprovitan. [**Experience with Inoculation Malaria.**]—*Arch. f. Dermat. u. Syph.* 1929. Jan. 20. Vol. 157. No. 1. pp. 125–141. [20 refs.] [Municipal Hosp., Dresden-Friedrichstadt.]

This strain of tertian malaria, passed on intravenously for 200 passages, has never shown gametocytes. In quantities of 5 or 10 cc. it has produced infection in one injection in 86·4 per cent. of cases. In 2·9 per cent. more than two injections had to be given. Incubation periods varied from 2 to 15 days—average 4. In 24 per cent. there was spontaneous recovery from malaria. In 6 of 165 cases the infection had to be cut short on account of the patient's condition. The paper contains much of venereal interest. With saprovitan treatment we are not concerned.

C. L.

Mayr (Julius K.). Zur Pathogenese der Impfmalaria. [**Pathogeny of Inoculation Malaria.**]—*Muench. Med. Woch.* 1928. Dec. 28. Vol. 75. No. 52. pp. 2208–2209. [Clinic & Polyclinic for Skin & Genital Diseases, Univ., Munich.]

It is noted that plasmodia develop after being on ice, that they are morphologically unchanged after 24 hours in a leech but are destroyed,

schizonts that is, after two hours in a mosquito. The writer took blood from a malaria case, whose extent of infection is however not noted, and injected it into patient No. 1 at 9 a.m. From him, directly or indirectly, the following transfers were made.

a.m.	9	10	11	12	p.m.	1	2	3	4	5
	Pt. 1	Pt. 2	Pt. 5	Pt. 3						Pt. 4.

In all cases 5 cc. of blood were injected and all persons became infected, the malaria attack in the last infected beginning 4 days before that of the first. Indeed, the fewer the parasites the earlier the attack. Again malarial blood was drawn into a syringe and ejected; alcohol was then drawn in and the syringe cleaned with distilled water; a solution of sodium and strontium salts was then drawn in and injected into a man; three times out of five infection followed. The same occurred with neosalvarsan.

C. L.

Paoletti (Umberto). Reperti ematologici nei paralitici e terapia malarica. [**The Blood of Paralytics in Inoculation Malaria.**]—*Policlinico.* Sez. Med. 1928. Oct. 1. Vol. 35. No. 10. pp. 555–572. [11 refs.]

In 12 cases of general paralysis and three of Plaut's hallucinations the first effect of malaria, given as treatment, was in general a slight fall in polymorphs, a large one in lymphocytes, and a rise in monocytes: during the course of the malaria a slight fall in polymorphs, an increase in lymphocytes, and a variable condition of monocytes: after malaria the monocytes usually fall to normal while the others move erratically.

C. L.

Kopeloff (Nicholas) & Fiertz (Charles O.). **The Clinical Significance of the Life Cycle of the Parasite in Induced Malaria.**—*Amer. Jl. Med. Sci.* 1928. Nov. Vol. 176. No. 5. pp. 664–672. With 5 text figs. [2 refs.] [Psychiat. Inst., Ward's Island, N.Y.]

The writers have examined over 300 paretics treated with a single strain of tertian malaria, and are satisfied that it has been for many months now without gametocytes. The following curious statement is made—"In general, young ring forms, or crescents, are few in number at the beginning of a paroxysm but become more numerous after the height of the febrile curve has been reached."

C. L.

Herrmann (G.) & Hlisnikowski (H.). Blutgruppen und Verlauf der Impfmalaria.—**Blood Groups and Course of Inoculation Malaria.**]—*Med. Klin.* 1928. Nov. 2. Vol. 24. No. 44 (1247). pp. 1700–1701. With 1 text fig. [4 refs.] [Psychiat. Clinic, German Univ., Prague.]

Malarial infection was found to be more virulent when injected from one of the same blood group than otherwise. The amount of blood transfused was 6 to 9 cc.

C. L.

Harris (Noel G.). **A Case of Rupture of the Spleen after Artificial Induction of Malaria.**—*Lancet.* 1928. Sept. 8. pp. 500–501. [4 refs.]

A general paralytic, infected with benign tertian malaria, had ten good rises of temperature during twelve days. "On the morning following the tenth rise he jumped out of bed suddenly. A few seconds after getting back he collapsed, and was dead in an hour. At autopsy the abdomen

was found to be full of blood from a ruptured spleen. The spleen was only semi-solid, and the vessels appeared to have just torn away, no defined rent being visible."

C. L.

König (Walter Jos.). Hämolytischer Ikterus nach Malaria. [**Haemolytic Icterus after Malaria.**]—*Med. Klin.* 1928. Mar. 9. Vol. 24. No. 10. pp. 378–380. [12 refs.] [Med. Clinic, Univ., Rostock.]

Two cases are described with lessened resistance of red corpuscles, enlarged and painful liver and spleen, bilirubinaemia and bilirubinuria. Plasmodia were found in neither.

C. L.

Raynal (J.). Le paludisme dans la province de Diégo-Suarez : quelques index spléniques. [**Malaria in the Province of Diego-Suarez.**]—*Bull. Soc. Path. Exot.* 1928. Oct. 10. Vol. 21. No. 8. pp. 629–635. With 3 plans.

A survey of a province in Madagascar where malaria is hyperendemic.

C. L.

Kabelík (J.). Eine Bemerkung zur Arbeit des Herrn Dr. G. J. Perekropoff : " Zur Morphologie der Parasiten der chronischen Malaria." (Centralbl. f. Bakt. Abt. I. Orig. Bd. 108. 1928. S. 26.) [**Morphology of Parasites of Chronic Malaria.**]—*Cent. f. Bakt.* I. Abt. Orig. 1929. Jan. 2. Vol. 110. No. 1–3. pp. 111–112.

Kabelik identifies the involution forms of Perekropoff (*ante*, p. 26) with those which he reported in 1917 as sexually immature resistant forms. (*Wien. Klin. Woch.* 1927. p. 51.)

C. L.

Machwiladse (N.). Zur Frage der kongenitalen Malaria. [**Congenital Malaria.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Dec. Vol. 32. No. 12. pp. 609–610. [5 refs.] [Med. Clinic, State Univ., Tiflis-Georgia.]

A babe died an hour after birth. The liver and spleen were enlarged and liver smears showed merozoits grouped in twenty-fours and thirty-twos. The mother had all three species of plasmodium in her blood.

C. L.

Magid (M. I.). Ein Fall von Malaria tropica sub partu. (Zugleich ein Beitrag zur Frage der angeborenen Malaria). [**Subtertian Malaria in a Parturient Woman. Congenital Malaria.**]—*Monatsschrift f. Geburt. u. Gynäkol.* 1928. Aug. Vol. 79. No. 6. pp. 404–413. [28 refs.]

The mother died comatose on the fourth day after delivery. No plasmodia were found in her organs. *P. falciparum* was first seen in the baby on the 22nd day.

C. L.

Bird (W.). The Treatment of Chronic Benign Tertian Malaria with Smalarina Cremonese.—*Indian Jl. Med. Res.* 1928. Oct. Vol. 16. No. 2. pp. 347–355. [21 refs.] [Quinine & Malaria Enquiry, Kasauli, India.]

Bonura (Pietro). Distribuzione della malaria in provincia di Bologna quali le specie di *Anopheles* riscontrate nelle zone malarigene.—*Arch. Ital. Sci. Med. Colon.* 1928. Feb. Vol. 9. No. 2. pp. 84–95. With 2 maps in text. [Inst. of Trop. Path., Univ., Bologna.]

Cavallini (E.) & Crucillà (G.). Insolazione e malaria.—*Ann. di Med. Nav. e Colon.* 1928. Nov.–Dec. Year 34. Vol. 2. No. 5–6. pp. 336–338. [4 refs.]

Cortes (Narciso Alonso F.). Particulares aspectos de la endemia paludica en Valladolid. Epidemia de Tordesillas.—*Medicina Países Cálidos.* Madrid. 1929. Jan. Vol. 2. No. 1. pp. 20–47. With 15 text figs.

Deutsch (B.). Das klinische Bild der angeborenen Form der Malaria.—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. May. Vol. 32. No. 5. pp. 243–247. [4 refs.]

Ferrari (Antonino). A cura da malaria e sua prophylaxia domiciliar.—*Brasil-Medico.* 1928. Nov. 3. Vol. 42. No. 44. pp. 1231–1233.

Fróes (Heitor). Importancia practica do methodo "Cropper-Fróes" em malariologia.—*Brasil-Medico.* 1928. June 23. Vol. 42. No. 25. pp. 675–676.

——. Curva microlymphocytaria no impaludismo agudo. Nota prévia.—*Arch. Brasileiros de Med.* 1928. Oct. Vol. 18. No. 10. pp. 794–797. With 6 charts on 3 plates.

——. Curva do indice urinario de concentração nycthemerica (I.U.C.N.) em dois casos de impaludismo agudo de fórma mista (Vivax-Falciparum).—*Brasil-Medico.* 1928. Nov. 3. Vol. 42. No. 44. pp. 1229–1231. With 2 charts in text. [2 refs.]

Habermann (Rud.) & Serefis (Sergius). Impfmalaria und hämatopoetisches System.—*Klin. Woch.* 1928. Sept. 16. Vol. 7. No. 38. pp. 1832–1833. [9 refs.]

Meihuizen (F. H.). Twee gevallen van Malaria.—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1929. Jan. 21. Vol. 69. No. 1. pp. 59–60.

Millan Muñoz (Jose). Un caso de urticaria paludica.—*Medicina Países Cálidos.* Madrid. 1929. Jan. Vol. 2. No. 1. pp. 65–66.

Mondini (E. M.). L'infezione malarica nella città e nella provincia di Palermo nel quinquennio 1921–1925. Rilievi statisticoclinici.—*Pediatria.* 1928. Nov. 1. Vol. 36. No. 21. pp. 1149–1157. With 1 text fig. [Inst. Clin. Pediat., Univ., Palermo.]

Paterson (A. R.). Malaria and Development: the Report of the Malaria Commission of the League of Nations on "Principles and Methods of Anti-Malarial Measures in Europe" in Relation to Conditions in Kenya.—*Kenya & East African Med. Jl.* 1928. Nov. Vol. 5. No. 8. pp. 251–281.

Sergi (Antonio). Importanza diagnostica della malaria.—*Malariologia.* 1929. Jan. 31. pp. 68–72. [1 ref.]

Shvarcman (M.). [Malaria in the Lena Valley.]—*Russian Jl. Trop. Med.* 1928. Vol. 6. No. 6. pp. 352–354. [7 refs.] [In Russian. English summary p. 354.]

Taliaferro (William H.). Some Serological Studies in Malaria.—*Amer. Jl. Pub. Health.* 1928. June. Vol. 18. No. 6. pp. 793–795. [9 refs.]

Trautmann (Edgar). Die Behandlung des Kreislaufs bei der Impfmalaria.—*Deut. Med. Woch.* 1928. Dec. 14. Vol. 54. No. 50. p. 2101.

CORRECTION.

Jancsó (Nikolaus). Experimentelle Untersuchungen ueber die Malaria infektion des Anopheles und des Menschen beeinflussenden Umstände. [**Researches on the Circumstances influencing Malaria Infection of Anopheles and Man.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1921. Vol 25. Beiheft 2. pp. 5–48. With 9 text figs.

The abstract on work by Jancsó undertaken from 1901 to 1904, published in 1921, and appearing in this *Bulletin* for August, 1922, requires alteration. From 18 cases of tertian malaria 22 sets of *Anopheles maculipennis* were infected and "inoculation" [inokulation] by their means attempted into 22 persons, of whom one became infected. From 13 cases of quartan malaria 18 sets of anopheles were infected, and "inoculation" attempted into 3 persons, without effect. From 22 cases of subtertian malaria it was attempted to infect 69 sets of anopheles, and "inoculation" was essayed in 43 persons of whom 19 gave a positive result, crescents being first seen on the sixth or seventh day of infection. Detailed protocols giving the histories of donors, mosquitoes and recipients are published.

C. L.

LABORATORY REPORTS.

GOLD COAST. **Annual Report of the Medical Research Institute, Gold Coast, from 1st April, 1926, to 31st March, 1927.** [YOUNG (W. A.), Director.]—*Gold Coast Rep. Med. & San. Dept. for Year ended Apr., 1926–Mar., 1927.* pp. 47–92. With 3 plates.

The burden of this Report is Yellow Fever—*anceps fatorum via*, since before the appearance of its successor the eager and devoted study of this disease was destined to end in tragedy for the gifted author himself. Unrivalled opportunities for its study were afforded by two epidemics and several smaller outbreaks, and seventeen very complete post-mortem investigations of its pathology were carried out by the zealous author. The epidemics, as is emphasized, occurred in inland towns. In not any case of the disease was " any suspicion of a leptospira " encountered ; indeed, the only leptospira known, at present, on the Gold Coast is the non-pathogenous species, homoeomorphic with *L. icterohaemorrhagiae*, found in water. Other points emphasized are that Kroo people are not essential for an epidemic outbreak, that native women take and die from the disease, that babies suffer from a mild form which may or may not turn out to confer immunity, that intimate association with native life in the native quarter—as, for example, in missionary work—is a necessary condition of infection for Europeans, that possibly " the most definite symptom " of the disease is albuminuria, and that leucocyte-counts are of no value in diagnosis. [The belief that the infection is restricted to man and mosquito is still maintained here, the fact of the transmissibility to Macacus monkeys having not yet been discovered.] Finally, the lamented author expresses an " intuition " of the existence of some definite relation between meteorological conditions and the development of the yellow fever virus in the mosquito. Near Accra an outbreak of relapsing fever was concomitant with the latter part of a yellow fever epidemic, and this gives the occasion here for an elaborate differential diagnosis between the symptoms and the pathological phenomena of the two diseases. Furthermore, attention is drawn at full length to a case diagnosed provisionally as yellow fever (not only clinically, but also from the circumstance that the young patient came from a compound where two cases of that disease had occurred) which proved, post-mortem, to be a case of tuberculous septicaemia.

Some interesting observations on the subject of plague immunity and plague vaccine—which is now prepared locally—are recorded. The virulence of the plague bacillus is not affected by long cultivation (7–9 months), but virulent strains of the plague bacillus passed through an immunized *Cricetomys gambianus* (pouched rat) suffer distinct loss of virulence for this species, and virulence is not regained in culture or in repeated passage through susceptible Cricetomys. The non-virulent plague bacillus thus obtained, though it is not innocuous, has some interesting reactions of its own : a vaccine prepared from a virulent strain gives no protection against infection with this non-virulent strain, and, vice versâ, a vaccine prepared from the non-virulent strain imparts little or no protection against infection with the virulent strain ; but animals after their recovery from infection with a non-virulent strain are immune to the virulent strain. The *killed* non-virulent organism, moreover, has no immunizing property. The possible bearing of these observations on the course of human epidemics

of plague and on the efficacy of human plague vaccines is pointed out. The method of preparing plague vaccine is described, but is not new in principle.

Nineteen malignant tumours (2 cancer and 17 sarcomata of sorts) were verified histologically. Of 397 cases presumed to be dysentery, 56 were amoebic, 18 flagellate alone, 2 due to *Balantidium coli*, and 12 gave pure cultures of bacilli (7 Flexner, 2 Shiga, 2 Schmetz, 1 Strong). Of 487 specimens examined for evidence of worms 299 were positive, many being multiple infestations ; Necator was present in 154, Ascaris in 148, Trichuris in 30, Strongyloides in 9, Oxyuris in 1, Taenia in 12, Schistosoma in 3.

At Sekondi a remarkable case of massive tuberculosis of an enormously enlarged liver in a male of 27 years is noted as a curiosity. In 649 blood examinations *P. falciparum* was found in 220, *P. malariae* in 40, and *P. vivax* in 1 only ; in 285 examinations of faex hookworm was present in 28, *Entamoeba histolytica* in 20, and *Balantidium coli* in 1 ; the Flexner bacillus in 16, and the Shiga bacillus in 4. In 70 specimens of sputum the tubercle bacillus was found in 20, and in 70 specimens of urine eggs of Schistosoma in 5. The non-pathogenous leptospira homoeomorphic with *L. icterohaemorrhagiae* exists in the Sekondi water.

In a skeleton report the Medical Entomologist notes that *Aëdes argenteus* can breed in 30 per cent. of sea water and that Anopheles also breeds in local lagoons ; he also has some preliminary remarks on the tsetse-flies of the Volta basin, and promises an account of an attack on termites by shattering their earthworks with explosives followed up by fumigating and otherwise poisoning the ruined site.

A. Alcock.

NIGERIA. **Annual Report of the Medical Research Institute, 1927.** [CONNAL (Andrew), Director.]—*Ann. Med. & San. Rep. Nigeria, 1927.* Appendix A. pp. 1–46. With 6 charts & 9 plates.

Discriminative detail and fine photographic illustration are salient features of this report. Much attention both of observation and experiment was given to rat-plague. At Ereko there were examined for evidence of plague-infection 51,621 black rats, 4,292 brown rats, 269 un-named swamp-rats, 3,454 musk-" rats " (Crocidura), and 20,519 mice, all brought in from the collecting stations of Lagos; as well as 29,630 rat-spleen smears sent from Abeokuta, Ibadan, and Ifo. From the Lagos collections 573 (1·11 per cent.) black rats (*rattus*) and 103 (2·39 per cent.) brown rats (*norvegicus*) were found infected, but not any of the multitude of mice. The proportion of infected rats ranged from 0·06 per cent. of 4,872 in June to 3·22 per cent. of 5,443 in October. (It is noted that in animals free from plague bacilli enlarged glands were fairly common and even abscesses were found—due to other causes.) All attempts (6 experiments on 15 rats) to transmit plague to wild rats by feeding with infective material were unsuccessful. Six of seven attempts to infect guineapigs through the denuded (but carefully uninjured) skin were successful, although the proportion of bacilli penetrating the skin was very much smaller, and the fatal issue was much later, than in a similar proportion of guineapigs infected through the scarified skin. The tendency to a pulmonary localization in some of the animals infected through the intact skin is significantly emphasized.

Of 7,274 fleas collected from rats 4,956 were *Xenopsylla cheopis*, 2,305 were *X. brasiliensis*, and 13 were *Ctenocephalus canis*.

Thirty-five cases of blackwater fever are carefully recorded in methodical summary, four (including 2 children) being in females. The term of previous residence in the tropics ranged from many years to—in one case each—10 months, 9 months, and perhaps 8 months. In every case where an account of the onset could be obtained the initial phenomena were those of a malaria attack, and the existence of malaria was definitely proved in 14 cases by blood-examination after the appearance of haemoglobinuria. In every case but one quinine seems to have been taken, but in 6 cases the amount was small, and in 7 cases it was taken *after* the occurrence of the preliminary rigor that presumably indicates active haemolysis.

The dermatology records include two cases of mycetoma, both with bright red granules in the discharge ; numerous cases of moniliasis of the tongue ; and the common existence of a local monilia-dermatitis clinically indistinguishable from that caused by tinea. A skin affection in appearance very much like the maculo-anaesthetic type of leprosy is described by the name " pseudo-leprosy," as of common occurrence in young healthy males ; it is distinguished by a prolonged history with slow progress, the absence of acid-fast bacilli, no anidrosis, and a different histology.

The record of tumours consists of 15 cases of carcinoma (8 being epithelioma), 14 sarcoma, 4 melanoma, and 2 rodent ulcer.

The entomologist's report is full of interesting detail. Of mosquito larvae collected by the sanitary inspectors about dwelling-places more than half are *Aëdes argenteus* and more than one-third are *Culex nebulosus*. Much information is being accumulated about the endo-parasites of bloodsucking flies, particularly of natural infection of wild mosquitoes with filaria and malaria. Of great importance is the series of 24 enlarged photographs showing the extraordinary variation in the number and distribution of the white scales of the abdominal vesture of *Aëdes argenteus* (*Stegomyia fasciata*)—variations described in 1897 in the *Bulletin of Entomological Research* (see this *Bulletin*, Vol. 25, p. 274) by Mrs. Summers Connal.

A. A.

i. Nigeria. **Annual Report of the African Hospital Laboratory, Lagos, 1927.** [Butler (G. G.), Pathologist.]—*Ann. Med. & San. Rep. Nigeria, 1927.* Appendix C. pp. 59–76.

ii. ——. **Annual Report on the African Hospital Laboratory, Kaduna, 1927.** [Morrison (H.), Pathologist.]—*Ibid.* Appendix D. pp. 77–90. With 1 folding chart.

i. The Lagos Hospital laboratory is worked by one medical officer with three native assistants-in-training. The report is full of interesting detail, especially the summaries of post-mortem examinations, which cannot, however, be abridged. In the course of 3,385 routine blood examinations malaria parasites were found in 30 per cent., microfilaria in about 3 per cent., trypanosomes in 5 cases, and relapsing fever in 2 cases only ; 93·2 per cent. of the malaria parasites were subtertian, and 6·7 per cent. quartan. Of 428 children examined irrespective of any illness 75 per cent. gave evidence of malaria in a single blood-examination. In 295 tests of native serums the Sachs-Georgi reaction was positive in 57 per cent. In the course of examinations of faeces

Entamoeba histolytica occurred in 7 per cent. of 527 natives and 7 per cent. of 488 Europeans; ascaris in 71 per cent. and ancylostoma in 50 per cent. of the natives; and taenia in 11 instances and *Schistosoma mansoni* in 4 instances among natives. The Lister Institute having reported evidence (by culture and agglutination tests) of Shiga, Flexner Y (and other types), and Schmitz bacilli in dysenteric material from this laboratory isolated in 1926, the author is now able to affirm the existence of most types of bacillary dysentery in Lagos. Of 51 suspected stools examined in 1927, eleven have yielded organisms of the Shiga type, and eight organisms of the Flexner type. *Schistosoma haematobium* has been found in 5·5 per cent. of 499 urine examinations (but higher percentage was disclosed in the mortuary). The tubercle bacillus was detected in 18·99 per cent. of 295 specimens of native sputa. Carcinoma was confirmed microscopically in 8 cases, sarcoma in 4, and lymphosarcoma in 2; of the cancers 3 were primary of the liver and 1 of the stomach. Autopsied deaths from natural causes numbered 236—of which 15 per cent. were from disease of the respiratory organs (excluding tubercle); 15 per cent. dysentery and diarrhoea; 14·4 per cent. tuberculosis; 9 per cent. (including 5 aortic and 2 cardiac aneurysms) cardiovascular disease; 8·4 per cent. disease of central nervous system; 8 per cent. chronic nephritis—to name the most important. Among young infants the most frequent cause of death observed was bronchopneumonia.

For two years the author has been recording the weight of various viscera in West African negroes; of 148 adult male brains the average weight is here recorded as 45·9 oz., and of 27 adult female brains 40·7 oz. The average weight of the thymus in four infants not exceeding a year is recorded as 0·68 oz.; in nine young children between one and five years as 0·86 oz.; and in six older children up to 15 years 1·12 oz.

ii. The laboratory of the Kaduna hospital is worked by the pathologist with two native African attendants. Besides interesting facts the report includes a comparison and critical appreciation of the Kahn test and is enlivened with some philosophy. In 1,519 examinations of native Africans' blood subtertian parasites were found in 18 per cent., quartan in 1 per cent., and benign tertian in 0·1 per cent.; microfilariae in nearly 1·5 per cent.; and trypanosomes in two instances. Special notice is taken of a case of myeloid leucaemia in a native, which the author thinks is a novel record. The Sachs-Georgi test was positive in 45·4 per cent. of 295 native cases, but the author proposes to use the Kahn test in future. *Schistosoma mansoni* was found in 4·8 per cent. of male and in 1·5 per cent. of female faex in the course of 1,243 individual examinations, and *S. haematobium* in 1·27 per cent. of 928 examinations of urine. The percentage of Taenia in the faecal examinations was 6·9 and of Ancylostoma 42·5 per cent. The tubercle bacillus occurred in 15·8 per cent. of 172 native sputa. One case of carcinoma and three cases of sarcoma—one of them in a boy of 18 years—were observed in local natives. Only 24 post-mortem examinations were made, the population being Moslem, so that it is only on a coroner's order or other extraordinary occasion that an autopsy is possible. Among the most interesting items are to be found: (1) Two cases of carcinoma of the pancreas in comparatively young natives. (2) Traumatic rupture of a spleen 22 times normal size, where early scar tissue was observed at autopsy to have formed around the rupture. The victim had improved day by day under very strict conditions of

recumbent immobility, and he would probably have recovered had he not been so over-confident as to disregard those conditions, in a fatal unwatched moment, after he had been in hospital for a fortnight. (3) A fatal case of malignant malaria where, in a count of 500 red cells, 34 per cent. were parasitized, multiple ring infection, all stages of schizogony, and numerous crescents being evident. Post-mortem, the abdominal cavity " was dried up," the peritoneum like thin parchment, and the viscera except liver and spleen, pallid. The liver and spleen were full of malaria pigment, the liver almost black, and the spleen a shapeless mass of stuff so friable as hardly to furnish a piece suitable for sections. (4) A fatal case of cerebral haemorrhage in a Hausa 25 years of age ; the liver showed cirrhosis, and the kidneys a general early fibrosis and all the signs of chronic interstitial nephritis.

A. A.

South African Institute for Medical Research. **Annual Report for the Year ended 31st December, 1927.** [Lister (F. S.).]—83 pp. With 2 charts & 1 plate. 1928. Johannesburg.

The total expenditure of the year (in round numbers) was £42,000, of which £15,893 was for the " Research Division," which includes separate research departments of bacteriology, parasitology, entomology, biochemistry, and pathology.

Researches in bacteriology comprise various aspects of plague, tuberculosis, hay fever, the bacilli of pneumonia and cerebro-spinal meningitis, and certain specific effects of inhalation of dust. Experiments to determine the destructive significance of the Tiger River virus for pestiferous gerbilles proved that it is a good food-poison, but showed no evidence of ability to cause an epizootic—an experience parallel with that of d'Herelle in a campaign against field-mice in France with *Bacillus typhus murium*. In laboratory experiments the value of the bacteriophage of d'Herelle in the treatment of plague also accorded with the conclusions of that observer ; single inoculations did not impart immunity, though repeated doses did to some extent, and as a therapeutic agent it was capricious. Investigations of sputa showed that tuberculosis in South African natives is always caused by bacilli of human, not bovine, type ; extensive study of the pathological lesions found in native sufferers is proceeding. The principal local agents in hay fever are discovered to be pollens of grasses—particularly the common tall veldt grass *Eragrostis plana* and the ubiquitous fodder-grass *Cynodon dactylon*—and of various Compositae ; treatment by extracts of these pollens has been on the whole " very satisfactory." Persistent taxonomic study (of itself now regarded as of merely academic value) of the types and groups of bacteria of the lobar pneumonia and cerebro-spinal fever of South African miners has disclosed the most interesting fact of continuous variation of both pneumococcus and meningococcus. There is a tendency for the recognized strains of former years to disappear and to be replaced by " Aberrant strains " ; moreover a careful study of many old cultures of the pneumococcus revealed alterations of their form, specific powers, and virulence. Experiments on dust-inhalation show that in animals exposed to clouds of amorphous silica dust-laden cells accumulate on the walls of the alveoli, where they may either be absorbed or set up fibrosis. Experiments arising out of evidence that certain workers in asbestos show unusual liability to tuberculosis may be noticed here—

although not included in this section ; peculiar bodies were found in the lungs of guineapigs exposed to an atmosphere excessively laden with asbestos dust.

The principal researches of the Entomology department—an extensive mosquito survey, and the discovery of new species of xenopsylla of gerbilles—have already been noticed.

In the department of Parasitology of 240 suspected stools that came in for concentrated examination *ad hoc*, 108 were found to contain eggs of hookworm ; investigations of Johannesburg street dust produced, *inter alia*, eggs of hookworm, common round worm, *Schistosoma haematobium*, and *Hymenolepis nana*, and cysts of *Entamoeba histolytica* and *Giardia intestinalis* ; and the action of neostam—an organic antimony compound—in urinary schistosomiasis was carefully studied and was considered to be slower than that of tartar emetic, but to have the advantage of not causing any distress to the patient—these being the more interesting items. In the department of Pathological Research, besides work on cultivation of animals tissues *in vitro*, attempts were made to produce tumours experimentally.

From the big magazine of the " Routine Division " of the Institute the following items are selected. The number of specimens examined under the heading specified diseases were 57,797, general bacteriology 5,656, chemical 5,193, medico-legal 1,037, parasitology 2,470, and pathology 5,316. Among specific diseases there has been a very marked increase in amoebic dysentery. Suspected cases of enteric fever reached the high figure of 5,779 ; here a large number of comparisons indicated the more sensitive nature of the complement-fixation test than of the Widal test, but also showed that both tests ought to be applied in connexion. A second case of gonococcal endocarditis, diagnosed p.m. (as in a case reported last year) by isolation of the organism from vegetations on the aortic valves, is reported. Of 124 cases of malaria 60·6 per cent. were simple tertian, 24 per cent. malignant tertian, 14·5 per cent. mixed tertian, and 1 case was benign tertian and quartan mixed ; although no recognized malaria-carrying Anopheles is known to exist in Johannesburg a case actually occurred where a son living in the same house with his father went down with malaria in the second week of the father's illness from that disease. The pneumococcus was the causal agent of meningitis in 83 patients, of whom 54 were from the mines, and among other organisms occurring as causal factors was a streptococcus in 24 cases, the influenza bacillus in 4, *Staphylococcus aureus* in 1, and *Bact. typhosum* in 1. Of 16 strains of pneumococcus isolated from 25 pneumonia specimens 15 did not conform to any of the recognized Lister Institute types ; a serum prepared from 6 of the prevalent strains was tested in 21 cases of pneumonia, of which 18 recovered. In 408 specimens examined eggs of Schistosoma were found in 147—of which 124 were in the urine and 23 in the faeces ; the species in urine were *S. haematobium* (117), *S. mansoni* (5), and *S. spindalis* (2) ; and in the faeces *S. mansoni* (13) and *S. haematobium* (10). The tuberculosis specimens, chiefly sputa, numbered 23,528, of which 20,188 were from mine-workers ; the percentage containing the bacillus was of the total number, 17·3 ; of the mine-workers, 17·2 ; and of the others, 17·7. A striking instance occurred of a serum from a typhus fever patient agglutinating *Proteus* X 19 and also *Bact. typhosum*.

Interesting observations are recorded of the gradual improvement of the blood picture in cases of pernicious anaemia under the

liver treatment of Minot and Murphy. A very great all-round increase in the number of routine biochemical examinations is reported. Some special investigations not of routine or arising directly from routine work are recorded here, namely: (1) An investigation of a *sporadic* disease termed "sweating-sickness," or miliary fever, occurring in a few native miners; the signs and symptoms are marked general sweating, development of multiple (sometimes symmetrical) trophic sores, tachycardia, a temperature usually subnormal and seldom rising above 99·5° F., sometimes mental symptoms, and in fatal cases gradual emaciation; (2) a minor investigation of the occurrence of boils among deep-level workers in another mine; (3) tests of the value of the bacterial filtrates introduced by Besredka, which showed that they have a definite healing action on indolent ulcers and resistant pyogenous skin-infections, but do not confirm their claim to impart local immunity; (4) a remarkable case, apparently only the second on record, mistaken for early tuberculosis, but duly demonstrated to be thrombo-angiitis obliterans of the spermatic vessels. Among 507 post-mortem examinations (all races included) conducted by the staff of the Institute at the Johannesburg General Hospital, tuberculosis was the cause of death in "approximately" 23·4 per cent., the percentage of native Africans being 30·0 (of 296 individuals). Among the 296 Africans were 10 cases of malignant disease, 8 being carcinoma (of which 3 were of the female thyroid), and 2 sarcoma. Pathological specimens from other sources numbered 1,746, and include, but without any particulars of race, 340 diagnoses of carcinoma, 36 of sarcoma, and 25 of other varieties of malignant growth, and 154 of tuberculosis, besides some curiosities, and among them 10 cases of idiopathic toxic necrosis of the liver of unknown causation. Besides this, 699 specimens of lung examined for the Miners' Medical Bureau showed uncomplicated tuberculosis in 250 instances, simple silicosis in 50, and both conditions combined in 175.

A. A.

Kenya, Colony & Protectorate of: **Annual Report of the Medical Research Laboratory for the Year 1927.** [Kauntze (W. H.), Director.]—*Kenya Ann. Med. Rep. for Year ending 31st December*, 1927. pp. 85–117.

This report is mainly a record of a full routine. The routine examination of blood sera has thrown doubt on the value of the treatment of yaws by the bismuth salt at present in use. A comparison of the Sigma and Wasserman reactions in 577 tests showed both tests positive in 327, and both negative in 132 instances; the Wasserman positive and the Sigma negative in 18; the Wasserman negative and the Sigma positive in 77; and the Wasserman positive and the Sigma just positive in 23 instances. The value of *Bact. coli* vaccines in chronic rheumatism and rheumatoid arthritis is considered to be established by a general and constant demand for them. A very full account is given of the routine examination of faeces for intestinal parasites. In 4,398 examinations *Taenia saginata* was observed in 934 cases, *Ascaris lumbricoides* in 999, *Ancylostoma duodenale* in 1,040, Trichuris in 1,093, *Schistosoma mansoni* in 153 and *S. haematobium* in 1; Strongyloides in 204, Oxyuris in 12, *Hymenolepis nana* in 6 and *H. diminuta* in 2; *Entamoeba histolytica* in 14, *E. coli* in 409, *Iodamoeba* in 159, *Endolimax*

nana in 29, Giardia in 71, Chilomastix in 7, and other flagellates in 53. Multiple infections were very common. In the pathological departments sarcoma was recognized in 21 and carcinoma in 5 native Africans.

A. A.

VAN DEN BRANDEN (F.). Rapport sur le fonctionnement du laboratoire de Léopoldville durant l'année 1926. [**Leopoldville Laboratory Report for 1926.**]—*Ann. Soc. Belge de Méd. Trop.* 1928. Sept. Vol. 8. No. 2. pp. 189–218.

During the year 1926 the number of examinations for detecting trypanosomiasis was 8,191; 161 new cases were admitted to the trypanosomiasis lazaret, and 55 new cases had ambulatory treatment. Since the introduction of the tryparsamide treatment the whole aspect of the lazaret has changed, the number of bed-ridden and tremulous, cachetic, and demented cases being much less; moreover, the percentage of cases apparently cured, which in 1923 was 14·0, was increased to 55·0 in 1926. In the Leopoldville district, where the whole population is officially examined every year, the percentage of infections diagnosed, which in 1920 was 2·0, was decreased in 1926 to 0·7. Among trypanocide drugs tested were antimosan (Heyden 661), 270 Fourneau, acetylarsan, and, in prophylaxy, Bayer 205. The watery solution of antimosan is neutral and therefore is painless in subcutaneous and intramuscular injection; its action, which is transient, is less energetic than that of tartar emetic; in chronic cases it aggravates the general state: it was tested in 8 cases. Fourneau 270 was tested in 14 cases in a 20 per cent. watery solution, individual cases receiving from 15 to 28·5 gm., intravena in weekly doses of 1 to 2 gm.; one case died during treatment, but not from the effects of the arsenic component, two cases complained of headache, and three complained of rather persistent disturbances of vision; in two cases the spinal fluid became quite normal; in chronic cases its effects are comparable with those of tryparsamide. Acetylarsan, which is "veritablement indolore" by subcutaneous and intramuscular injection, was tried in 10 cases, of which, in the course of treatment, two died of sleeping sickness, and a third of some inter-current disease, and one became too ill to finish the treatment, the course of treatment being 12 gm. in eighteen weekly injections of 0·75 gm. In the remaining 6 cases the general condition was improved and the lymphocytosis of the spinal fluid diminished, the fluid in one case becoming nearly normal. Bayer 205 was employed as a prophylactic in two small villages having a combined population of 183 souls. After removal of the individuals, 17 in number, discovered at the preliminary examination to be infected, the other inhabitants received in the case of each adult, two injections of 2 gm., and in the case of each child two injections of 0·5 to 0·1 gm. according to age—this was in 1925. Since then the inhabitants have been re-examined once again in 1925 and twice during 1926, with the result of finding only 3 infected individuals.

In 94 voluntary-sought examinations of sputa the bacillus of tuberculosis was found in 36 cases, and in the antituberculosis dispensary there were 53 new admissions, which were treated mostly by a porcelain-fitered bouillon-culture of the bacillus with "good results" in early cases; 200 newborn children were vaccinated against the disease. Noteworthy features of 358 examinations are the frequent finding (14 instances) of Balantidium and the

prevalence (60 instances) of hookworm above all other worms. Anti-pneumococcus (32,610 doses) and antimeningococcus (19,165 doses) vaccines were largely employed, the former in prophylaxis. At one camp of recruits the annual mortality from pneumonia has decreased since its use. In two other camps, one with a population of 7,197 vaccinated, the other with a population of 7,322 unvaccinated, the latter was the more affected by pneumonia—258 cases against 183 cases; but of course other circumstances have also to be considered in such a rough comparison. An interesting contribution to the question of congenital malaria is reported from Leopoldville: of 55 native women brought to bed 31 were infected with the Plasmodium, but in not one case was the newborn infant infected; in one case, however, trophozoites and gametocytes were found in the placental blood. A case of bronchitis due to an Aspergillus is recorded.

A. A.

Mansfield-Aders (W.). **Annual Report of the Biological Division for 1927.**—*Zanzibar Protectorate Ann. Rep. on the Med., San. & Biol. Divisions for Year 1927.* Section IX. pp. 49–78.

This report is devoted to the interests of the local sanitary department, 24 of its 30 pages being occupied by details of helminthology surveys and the other 6 pages by details of fleas found on local rats. Of the 24 pages of helminthology 20 contain information regarding the local incidence and propagation of hookworm. The local incidence is estimated at 93 per cent., estimated (by smear and flotation) from groups of natives from various parts of the Protectorate. *Necator americanus* (92 per cent.) is the prevalent species, against 8 per cent. of *Ancylostoma duodenale*. Soil pollution is rife throughout the Protectorate and is widespread, since the natives do not set apart common easing grounds. It is thought probable that the native has acquired some sort of tolerance of the infestation; but "generally persons showing over 10,000 ova per gramme [of faex] reveal clinical symptoms." *A. caninum* and *A. brasiliense* are very common in dogs. *Ascaris lumbricoides* is prevalent throughout the Protectorate, and Trichuris in Zanzibar. Tape-worm is barely known. *Schistosoma hematobium* is commoner than had been thought, and cercariae having all the structural characters of that species were found in nine of 249 individual dissections of the local *Isodora ovoidea*, a snail found in most of the ponds and swamps of the island. Two cases of infestation with *S. mansoni* were observed, both persons being from the mainland.

The black rat and its variety *frugivorus*, the brown rat and its variety *hibernicus*, and *Cricetomys gambianus* have been identified from captures made in the town of Zanzibar. The commonest rat-flea is *Xenopsylla cheopis*; *X. brasiliensis* is not uncommon, but *X. astia* is very rare. *X. crinita* was found on Cricetomys.

A. A.

Sergent (Edmond). Rapport sur le fonctionnement de l'Institut Pasteur d'Algérie en 1927. [**Report of the Algerian Pasteur Institute for 1927.**]—*Arch. Inst. Pasteur d'Algérie.* 1928. Mar. Vol. 6. No. 1. pp. 47–84. [48 refs.]

The first twenty pages of this report form a brief review of original investigations concluded during the year, the results of which, included

in nearly fifty papers, have already been published. The following items in this busy review may be noticed. An adjudication on anti-malaria policy, the principles of which, though so well understood, are still so complicated in application. For countries at the social level of Algeria it is here thought that State action is best concentrated on reduction of the numbers of mosquitos, quininization, and public instruction, with, of course, a watchful eye on the endemic index. Attention is recalled to the experimental production of oriental sore in white mice, the study of the early stages of development of the parasite in *Phlebotomus papatasii*, and to the confirmation of the specific difference between cutaneous Leishmaniasis of man and visceral Leishmaniasis of the dog. Researches on serum diagnosis of undulant fever; on the variations of bacteria from their specific standard under cultivation; and on the protective efficacy of the antituberculous vaccine of Calmette and Guérin are noticed. The well-established protective value of the Institute's vaccines for the four common pathogenous piroplasms is confirmed; and in their curative treatment tamarind root-bark has been found useless, and trypanblue, although without influence in babesia anaplasma and theileria infections, cuts short the worst attacks of true piroplasmosis in a few hours—even in moderate doses. It is again noticed that the theilerioses of North and of South Africa are two distinct infections. Attention is drawn to "formolized antirabic vaccine"—a well-keeping preservation of the killed virus freed from toxic adhesions—as a simple and efficient preventive of rabies in dogs. Minor papers on protection of potable water supplies, and on parasitology and medical zoology are also noticed.

The last eighteen pages contain details chiefly of laboratory and field work, and public service. The varied tale of laboratory analyses includes 10,508 items—medical, veterinary, and agricultural; and the issue of serums, vaccines, and other microbe-products amounts to more than 4½ million units. Altogether 72 scientific expeditions were undertaken by the staff, and 33 scientific or popular courses of instruction given, besides regular laboratory courses for army medical officers. Of 1,645 applicants 1,623 completed the treatment for rabies—with a mortality of 0·12 per cent. Dogs were aggressors in 1,506 cases, cats in 95, and rats in 13, and the small remainder were victims of jackal, monkey, equines, bovines, and pigs. In the preventi-curative treatment for malaria 246 kilos of monohydro-chlorate and 1,008 kilos of sweetmeats of quinine were expended.

A. A.

Bombay. **Report of the Haffkine Institute for the Year 1927.** [Mackie (F. P.), Director.]—46 pp. 1928. Bombay: Govt. Central Press. [14 annas; 1s. 6d.]

The subject matter of this very interesting annual report covers a wide range of research work and routine. Investigations undertaken relate to immunization, immunity and chemotherapy in plague, the value of indigenous drugs, the normal basal metabolic rates of adult Indians, sprue, nephrosis, the study of the faecal flora, maternal morbidity and mortality in childbirth and schistosomiasis. In addition to this research work, the energies of the staff of the laboratory are devoted to the routine of manufacture of plague and other vaccines, antirabic treatment, the extraction of snake venom and general

diagnostic laboratory procedure. Many of the investigations mentioned have been already published and others are in progress. The director treats critically and with detail of the important results which have been attained.

1. *Plague.* The epidemiology of plague in Bombay city presents most interesting features. The annual human mortality from plague in Bombay is steadily decreasing and the immunity of the Bombay rat is as steadily increasing. This immunity appears to be an inherited character, as the progeny of the Bombay rat show a high grade of immunity. There seems to be no flaw in the argument, for the comparison is directly made with the same rat from the locality of Madras, where there is little or no plague and the rats show a high proportional susceptibility to infection. Chemotherapy in plague does not appear to have made much progress, and although chemical compounds have been found which are highly bactericidal *in vitro* they are ineffective when introduced into the blood stream. Much attention has been concentrated on the application in plague of bacteriophage treatment, but the results cannot yet be said to have been successful. The manufacture of plague vaccine is very thoroughly organized and standardized. A standard nutrient broth medium and highly virulent seed organisms are used. Standardization is carried to the length of gauging the potency of each brew of vaccine upon rats before issue. The antigenic quality of plague strains varies considerably and attention is paid especially to the elimination of rough colonies. The possibility of usefulness of a serum therapy has evidently not been abandoned and a serum has been obtained recently which saves the lives of 80 per cent. of plague infected rabbits.

2. *Basal metabolism.* The enquiry into the normal rate for Indians is in progress. So far results point to a rate 10 to 23 per cent. below European and American standards.

3. *Sprue.* The work on sprue has been continuous in the laboratory for many years past. Some of the more recent findings appear to show " that the pancreas, as far as its external secretion is concerned, functions normally in sprue " and " that the liver is not affected in sprue to such an extent as to show impairment by liver function tests."

4. *Schistosomiasis.* The human disease is not endemic in India, but much valuable research has been conducted in India at the Bombay laboratory in regard to the analogous disease caused in herbivorous animals by *Schistosoma spindalis*. As this disease is solely an animal affection it lends itself especially to the testing of immunity and curative remedies. Some of these researches have already appeared and others are to be published in due time.

In reviewing this report one has only been able to indicate in a general way the nature of its contents.

W. F. Harvey.

FEDERATED MALAY STATES. **Annual Report of the Institute for Medical Research for the Year 1927.** [DOWDEN (R.), P.M.O.]—*Federated Malay States. Ann. Rep. Med. Dept. Year 1927.* Appendix A. pp. 32–57.

There is much good pasture here. Naturally, beriberi comes first, with remarks upon the effect of the destruction of market-gardens (first by floods and then by drought) upon the incitement of the disease, and with a brief account of the manufacture and experimental testing

of vitamin B extracts. A good deal is to be found on the treatment of malaria. Plasmochin in 0·03 gm. pill twice a day was tested on 46 cases of benign tertian, 10 cases of quartan, and 29 cases of subtertian; in the benign tertian cases the parasites disappeared by the 4th day, in one case only remaining until the 5th day (*one* trophozoite found); and in the quartan cases they disappeared on the 5th day. In the subtertian cases the results are described as disappointing in the matter of treatment, although the drug "appears to have the unique and valuable property of destroying subtertian gametocytes." Although plasmochin has the advantage of being tasteless, it is more toxic than quinine, cyanosis being the commonest symptom. In two cases high fever and collapse followed its use, and in one case diarrhoea, vomiting, and pain in the belly; it can therefore be given only under medical supervision. Results of treatment with radium-quinine (12 cases) and with methylene-blue quinine (11 cases) are tabulated; neither drug appeared to be efficacious and "the plasmodicidal action [of both] is disappointing." In the diagnosis of malaria by precipitation tests the antigen prepared by the TALIAFERRO method was not pleasing; but an antigen prepared from alcoholic extract of the ether-insoluble residue of infected spleen-pulp gave more success—the precipitate formed when the alcoholic extract was set on ice being taken up with saline, after separation.

In the treatment of tuberculosis sanocrysin was tested in 11 cases. The conclusions are that in early pulmonary cases it is better borne and may be followed by striking improvement, but that in advanced cases it may cause severe reactions which are likely to accelerate the course of the disease; two cases of cervical adenitis were not improved.

In the treatment of bacillary dysentery D'HERELLE himself concluded that the results with a stock bacteriophage were "somewhat disappointing" in local cases, and he therefore suggested the manufacture of a polyvalent preparation by isolation of numerous bacteriophages of local Flexner strains.

Ephedrine was tested in the treatment of asthma and of hay-fever. In six of 10 asthma cases it gave complete temporary relief, but half the patients suffered from its toxic effects. In hay-fever when directly applied in 3 per cent. solution it gave immediate temporary relief.

In grave cases of secondary anaemia the effect of liver extract (bullock) was not magical, but was better than that of iron and arsenic.

Among numerous suggestive laboratory studies the following may be mentioned: Attempts to follow the virus of tropical typhus in guinea-pigs have been inconclusive, but attempts to infect other laboratory animals have been encouraging in the case of the rat. Two probable cases of Japanese river fever were observed; and on about 300 rats, of which 95 came from the plantation that furnished one of these cases, Trombiculae of 4 species—*T. deliensis*, *T. oudemansi*, *T. pseudo-akamushi*, and *T. muris*—were found, the first of which is known to carry the disease in Sumatra. In laboratory experiments to determine the survival of *Bact. typhosum* and of the vibrio of cholera in heavily dosed specimens of local waters kept in flasks in diffused daylight at room temperature, sub-cultures made at 12-hour intervals showed the survival of the former for 4 days and of the latter for 3 days. In experimenting for a sign for the recognition of *Bact. typhosum* carriers, a well circumscribed zone of oedema and hyperaemia, of definite evolution and duration, was developed, in the case of a carrier, by

intradermal injection of 0·2 cc. of a 1 per cent. dilution of a filtrate (stored on ice) of a 7-days-incubated broth-culture of the bacillus; though the observations made are stated to be too few to justify conclusions as to the value of the test.

Among other items to which attention may be directed are a case of ainhum, a case of *Bacillus violaceus* infection, a case of black-tongue, a case of intestinal myiasis (rat-tailed larva of Eristalis), a case of an unusual intestinal ulceration, and a case of leishmaniasis; also to remarks on attempts to sterilize a *Bact. typhosum* carrier; to an investigation of the nature and incidence of broncho-pulmonary spirochaetosis, spirochaete gangrene having been observed post-mortem in 20 out of 101 deaths from pneumonia; to attempts to elucidate the mode of infection in leprosy; to unsuccessful attempts to convey the virus of leptospirosis between guineapigs by means of *Aedes argenteus* and *albopictus*; to unsuccessful attempts to infect monkeys with the virus of measles; and to remarks on an outbreak of variola in Selangor in which many features closely resembled those described as characteristic of alastrim. There are again some observations of melioidosis, the bacillus of which, it is stated, survives for some weeks in pond-water, and also is very resistant to desiccation, and sensitive to heat.

Sixty-two patients underwent the full course of Pasteur treatment for rabies, and 12 more at two outstations; there was no death. 322 dogs had protective inoculation.

Malignant tumours were identified in 79 Chinamen, 28 Tamils, 1 Japanese, 1 Sikh, and 7 Malays.

A. A.

Archives des Instituts Pasteur d'Indochine. 1926. Apr.–Oct. No. 3 & 4. pp. 155–175.—Services pratiques des Instituts Pasteur d'Indochine en 1925. [**Report of the Pasteur Institutes of Indo-China for 1925.**]

This is the report of the Pasteur Institutes at Saigon and at Nhatrang for the year 1925. The prevalent diseases, at Saigon as confirmed by laboratory diagnosis, were syphilis, intestinal helminthiasis, dysentery (predominantly amoebic) and malarial fevers. Tuberculosis is very frequent in the towns, where 6,315 children were vaccinated against the disease. Of 205 examinations of leprous matter 77 were positive. One hundred and sixty malignant tumours were diagnosed microscopically. 54 cases of diphtheria and 45 cases of Vincent's angina were detected. Of 1,276 applicants, 1,112 (including 180 Europeans) received the complete treatment for rabies, all but 28 being the result of dog-bite; 2 persons died after treatment. More than $4\frac{1}{4}$ million doses of anti-variola vaccine were distributed and 50,000 doses of dry vaccine. The chemists' department at Saigon includes not only biochemistry and food analysis, but a department of rubber research also.

The Institute at Nhatrang is concerned exclusively with the study of the diseases of animals, the preparation of veterinary vaccines and therapeutic serums, and the training of veterinary subordinates.

A. A.

Archives des Instituts Pasteur d'Indochine. 1927. Apr.–Oct. No. 5 & 6. pp. 151–175.—Services pratiques des Instituts Pasteur d'Indochine en 1926. [**Report of the Pasteur Institutes of Indo-China for 1926.**]

In this report the Institutes at Saigong and Hanoi are included, with the Veterinary Institute of Nhatrang—for the year 1926. In the Saigon laboratory statistics the diseases that again loom largest are syphilis, malaria, intestinal helminthiasis, and dysentery (amoebic in preponderance), and 45 cases of leprosy, 38 of diphtheria, and 61 of Vincent's angina were disclosed. Tuberculosis again had a conspicuous place; of 1,710 specimens of sputa 713 contained the bacillus, and of 2,098 school-children 39·7 per cent. gave the skin reaction; and 17,000 children were vaccinated against infection. Of 1,313 applicants 1,126 (including 253 Europeans) received the complete antirabic treatment; no death occurred, but 3 natives who had been very severely bitten in the face succumbed before completion of treatment. Close on 3½ million doses of antivariola vaccine were distributed. A board and laboratory for control of water supplies was organized in this year.

The Institute of Hanoi was opened this year. It consists for the present of 3 departments—pathology with microbiology, antirabies, and serology (vaccines), but is designed for development up to the Saigon standard. In the pathology department 131 malignant tumours were observed. Of 812 applicants, 750 underwent the complete treatment for rabies; of these 1 died; but there were also 3 deaths in the course of treatment, of persons who had been particularly severely bitten. More than 3 million doses of antivariola vaccine were widely distributed. A beginning was made with the manufacture of Calmette's antituberculous vaccine and 877 persons were thus vaccinated. Among 1,532 suspects of leprosy 358 were positive, in Hanoi.

The Institutes of Indochina participated with the local Government in some scientific missions during the year, among them a sanitary survey of plantations and a malaria survey of Cochin-china and South Annam. The latter survey shows that malaria is general and severe only on the densely jungly (and, fortunately, thinly peopled) red clay lands. On the alluvial and porous grey lands, which are intensely cultivated, well stocked, and populous, "the regress of endemic malaria is plain." Borel, the officer in charge of the survey, attributes the retreat of malaria to the *bien-être* of a population enriched and increased by good farming—implying good drainage—and by much cattle, and also to the influence of the European medical officer.

A. A.

Geneeskundig Tijdschrift voor Nederlandsch-Indië. 1928. Vol. 68. No. 3. pp. 426–443. Jaarverslag van de Landskoepokinrichting en het Instituut Pasteur te Bandoeng over het jaar 1927. [**Yearly Report of the Vaccine Establishment and the Pasteur Institute at Bandoeng in 1927.**]

The various activities of the institutes are summarized in this report. The total production of smallpox vaccine was 18·6 kgm.; the quantity issued was sufficient for nearly 11 million vaccinations. 653 patients were treated prophylactically against rabies; notwithstanding this treatment the disease broke out in 4 native patients,

in all cases within 30 days from the commencement of the cure. 12,809 pathological specimens were examined for diagnostic purposes. The quantities of various sera and vaccines issued by the institutes are mentioned.

W. J. Bais.

Geneeskundig Tijdschrift voor Nederlandsch-Indië. 1928. Vol. 68. No. 3. pp. 362–381. [20 refs.]—Uit het Jaarverslag van het Geneeskundig Laboratorium over 1927. [**Annual Report of the Medical Laboratory, Weltevreden, Java, for 1927.**]

The bulk of this report deals with the routine work of the laboratory. The following subjects deserve special mention.

An experiment with prophylactic antidysenteric vaccination (formalined vaccine) in a lunatic asylum gave no distinct results, but the number of cases was too small to allow any conclusions.

Various samples of native toilet powder contained lead.

Clinical thermometers, though originally free from error, probably suffer from continued use in the tropics.

In two goitre districts in the mountainous parts of Java iodized cooking salt was brought on the market under the control of the laboratory.

A list is given of the various concentrated anti-beriberi vitamin preparations supplied by the laboratory.

Experiments with the purified anti-beriberi vitamin showed that this is not sufficient to obtain normal growth of the experimental animals, a result in accordance with those obtained in other ways by British and American authors.

Basal metabolism was found to be lower in the tropics than in Europe.

Various other subjects have been dealt with elsewhere.

W. J. Bais.

Palestine. **Annual Report of the Laboratory Section, Department of Health Government of Palestine for the Year 1927.** pp. 63-74.

This report contains a vast amount of multifarious statistics, from which the following items of general interest are selected. In 23,923 blood examinations malaria parasites were found in 4,264 instances, namely, *Plasmodium vivax* in 2,636, *P. malariae* in 1,489, and *P. falciparum* in 139. In 19,532 urines *Schistosoma haematobium* was found in 34 : the local distribution of its intermediary host *Isodora truncata* was investigated. In 2,971 sputa the tubercle bacillus was present in 674. In 2,780 pharyngeal swabs the leprosy bacillus was found in 46. The intestinal parasites found in 20,762 samples of faeces were : the usual species of ascaris in 774, whip-worm in 1,659, thread-worm in 100, ancylostoma in 58, dibothriocephalus in 11, tapeworm (*saginata*) in 219, and hymenolepis in 108, and *Schistosoma mansoni* in 13 ; *Entamoeba histolytica* active forms in 1,377 and cysts in 232 ; Giardia in 383, Chilomastix in 1, Trichomonas in 756 ; also the Shiga bacillus in 135, the Flexner bacillus in 335, *Bact. typhosum* in 120, *paratyphosum A* in 19 and *B* in 20. Antirabic virus was

distributed to 10 subsidiary centres ; in all 788 persons were treated, with no failure and no accident. Of 37,328 primary antivariola vaccinations 88 per cent. were successful.

A. A.

i. Menk (Walter). **Banes Laboratory Report—1927. Additional and Explanatory Notes to the Consolidated Laboratory Report.**— *Sixteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1927. pp. 254–261. [United Fruit Co. Hosp., Banes, Cuba.]

ii. McDaniel (James C.). **Condensed Summary of the Laboratory Work done in Tela Railroad Company Hospital during 1927.**— *Ibid.* p. 263. [1 ref.]

i. The malaria-parasite rate disclosed in April-May (at close of the harvest season) was positive in 46 per cent. of 628 negroes examined and in 16 per cent. of 50 Cubans and Spaniards ; in 82 per cent. of the infected negroes, and in 37 per cent. of the infected Cubans and Spaniards, the parasite was the aestivo-autumnal : in September-October (just before the onset of the rainy season) the rate was positive in 22·3 per cent. of 139 negroes examined and in 9·6 per cent. of 208 Cubans and Spaniards, the aestivo-autumnal parasite occurring in 60 per cent. of the infected negroes and in 40 per cent. of the infected Cubans and Spaniards : the reduction of malaria cases towards October is attributed to the long dry season, the use of quinine, anti-mosquito measures, and changes in the general conditions of life. Examination of stools of 139 *unselected* hospital cases disclosed protozoa in 41 per cent., namely, *Entamoeba histolytica* in 24 cases, *E. coli* in 18, *Endolimax nana* in 20, *Iodamoeba bütschlii* in 8, *Chilomastix mesnili* in 3, *Trichomonas* in 3, *Giardia lamblia* in 6, besides unidentified forms in 3. Simple films of 2,330 specimens of emulsified stools examined in the laboratory routine showed hookworm infestation in 12·7 per cent., Trichocephalus in 22·2 per cent., and Ascaris in 18·6 per cent. Meinicke's turbidity test for syphilis and yaws was positive in 50 (apart from 11 ill-defined reactions) of 258 Haitian negroes and in 23 (apart from 7 ill-defined reactions) of 116 other negroes ; in 194 Cubans and Spaniards (no clinical yaws) there were 6 positive and 6 ill-defined reactions. Typhoid fever is not uncommon in the native population but is rarely observed in Haitian negroes. In a (fatal) Cuban case from which *Bact. paratyphosum* was recovered an abscess was found in a slightly enlarged spleen. The importance of blood culture in puzzling cases of fever is illustrated in a preliminary diagnosis of haemoglobinuric fever of a case where the blood culture became positive for *Bact. typhosum*. Among a few sporadic occurrences of bacillary dysentery Flexner's bacillus was recognized in 2 cases and the Y bacillus in 3. Contagious impetigo is said to be frequent, and staphylo- and streptococcus have been cultured from the unbroken vesicles. Tinea flava is seen more frequently than T. alba and T. nigra. The diphtheria bacillus has been observed twice in throat cases.

ii. In the area surveyed in this report diphtheria had been " almost non-existent " and very few calls for throat cultures had ever been made. Following the discovery of a case of that disease an investigation of throat lesions was started, in the course of which 145 cultures were made, and among them 10 were positive for *C. diphtheriae*.

A. A.

TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE. 1928. June 30. Vol. 22. No. 1. pp. 1–8. With 3 text figs. & 1 plate. **Laboratory Meeting.**

At this laboratory meeting Colonel A. C. H. GRAY exhibited sections showing remarkable pathological changes in the male breast, among them one of diffuse interstitial mastitis and one of of spheroidal-cell carcinoma. Among Dr. E. HINDLE's exhibits were: (1) Sections of skin of a hamster infected with the parasite of Chinese kala azar, demonstrating (*a*) the large accumulations of parasites in the subdermal tissues, and (*b*) a nodule in which the general appearance and distribution of the parasites were practically identical with the lesions of oriental sore; (2) specimens illustrating the effects of *Leishmania infantum* infection on hamsters (*Cricetulus griseus* and *C. triton*), namely, to begin with a temporary infestation of viscera (liver and spleen) and afterwards a permanent and exclusive migration to the testes or to the joints of the feet and the tail. Dr. D. KEILIN showed preparations of protozoa parasitic in various dipterous larvae. Colonel Clayton LANE exhibited apparatus for culture and observation of hookworm larvae, including demonstration of a new method for determining the longevity of the larvae in soil. Dr. Alan MCKENZIE showed a portable dark-ground illumination apparatus. Dr. P. H. MANSON-BAHR's exhibits included (*a*) photographs of a case of Mycosis fungoides, a chronic and usually fatal skin disease of which, although it was first described in 1812, the cause is still unknown; and (*b*) a blood-film of benign tertian malaria overstained with Manson's stain, showing small azurophil rings in the plasm of the red-cells—quite distinct from Schuffner's dots and supposed by Dr. CRAIK to be excretions of the parasite—which cannot be demonstrated with Romanowsky stains. Dr. Uvedale OWEN showed photographs of oriental sores, of *Trypanosoma gambiense* rash, and of leprosy rash showing its annular character. Dr. A. C. STEVENSON demonstrated Leptospira of infectious jaundice in tissues. Dr. J. G. THOMSON's exhibits were blood-films showing (*a*) *tenue* forms of malaria parasites and (*b*) Maurer's dots in *falciparum* infections. Professor YORKE and Dr. A. R. D. ADAMS demonstrated (*a*) extensive infection of skin with *Entamoeba histolytica* due to discharge from a liver abscess, and (*b*) colloid cancer of the splenic flexure in a case of amoebic dysentery.

A. A.

MISCELLANEOUS.

PATERSON (A. R.). **The Provision of Medical and Sanitary Services for Natives in Rural Africa.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1928. Mar. 31. Vol. 21. No. 6. pp. 439–452. [1 ref.]

The Medical and Sanitary Services in Kenya are chiefly provided by Government; there are also important medical centres under mission doctors, but not, at all events in rural areas, private medical practitioners. According to the regulations of the East African Medical Service the functions of its members comprise, besides the general care of the health of the natives and Government officials, "the initiation and execution of preventive and remedial measures, with a view to the treatment, control, and, as far as possible, the extinction, of the endemic and epidemic diseases which are prevalent in the East African Dependencies." How to fulfil these functions is the subject of this paper.

Under the heading Changing Africa, the author discusses the more important factors that are likely to affect medical and sanitary work in Kenya. One is the introduction of mechanical transport. Another is that the natives are not "helped or hindered by the tradition of an old religion or a great philosophy"; there are no great and outstanding traditions of life and conduct, and such prejudices as exist will soon pass, because of the insistent desire and demand for education. Another important factor is the rapid Christianization of this part of Africa, and this must affect both outlook and behaviour. The population is still sparse and over large areas the struggle with the bush is undecided. Under favourable conditions, however, African populations multiply rapidly. He comments on the difference between the social condition of those native tribes that are still untouched and those who have been for a generation in contact with Europeans: in these windows, lamps, tables, beds, forks and spoons, soap, locks, boxes, and the like are coming into use. Domestic animals are being segregated. Travel has become a commonplace. These and other changes constitute a "domestic revolution." While marked sanitary advance may be seen, there are tendencies elsewhere to conditions which suggest the slum.

He discusses the medical position in Kenya. The total sanctioned estimates in 1926 were £179,964, representing 7·5 per cent. of the total expenditure of the colony. The bulk of the vote is applied to the provision of native services for a population of about 2½ millions. Some figures are given of the hospitals and dispensaries, medical personnel, in- and out-patients, etc. A typical native district covers not less than 2,500 square miles, with a population of 50,000 to 350,000. Such a district is described, and the author continues:—

"There is clearly more than enough work for a Medical Officer or even for two in such a district, and the first problem which presents itself is as to which side of the work special attention should be directed. Let us take it that we concentrate on yaws and that the Medical Officer spends most of his time, therefore, touring his district and supervising his dispensaries. He and his dispensers succeed in the course of the year in treating, say, 20,000 cases. The people have come in for treatment with the greatest willingness, but they have come only for one or two injections; we have probably affected the course of the epidemic, but not all of the people are cured. An important piece of work has been done, but how much further

on are we ? Plague still costs this district about 500 lives every other year, and appears to defeat us utterly. The Medical Officer turns to his hospital and dispensaries and tries to forget about plague in clinical work ; but, just in proportion as he is a sound and thorough physician, he soon becomes seriously worried by the amount of preventable disease he has to treat and by the poor physical condition in which his patients arrive in hospital, and he now jumps to the other extreme and decides to become a sanitarian. He makes a generalization to the effect that the district must be cleaned up, that he must get the District Administrative Officer to take up the question of refuse disposal, latrines, water supplies, and housing generally. But when it comes to the point it is not so easy to see where or how to start. There are 10,000 huts scattered over an enormous district, and poor huts at that ; no one knows how to build better huts at a reasonable cost; he has no staff to help him in this reconditioning even if it were clear how it should be done ; then malaria becomes epidemic and he has his hands more than full over the length and breadth of his district. That is a picture of an average district, and the point which stands out is that no one single disease is prominent, no single disease is holding the people down. Malaria, plague, yaws, tuberculosis, dysentery, pneumonia, and tapeworm, are all playing a part. It is also to be noted that in the case of none of these diseases (save perhaps that of yaws and possibly tapeworm, and then only to a limited extent, in existing circumstances), can any marked control be readily effected by specific measures."

There follows an account of a district not in medical occupation with extracts from the diary of a sanitary survey. Here in the course of 21 days 920 patients were examined and full notes made, 609 stools were scrutinized for hookworm with a positive percentage of 76, and 22·6 per cent. were diagnosed as suffering from pulmonary tuberculosis. The figures for yaws, malaria, etc., are not given. Perusal of the diary leaves one with a picture of a vast amount of preventable disease.

The rest of the paper deals with the solution of the problems discussed. The number of medical officers has been increased and the provision of hospitals and dispensaries improved. The author regards hospitals as essential for humanitarian reasons and also because the diseases of a district must be investigated as an essential preliminary to the institution of preventive measures. Where possible, two European nursing sisters are to be attached to each hospital, after which the employment of native women as nurses and midwives will become possible. Discussing the staff and its standards, the author includes as essential a European Sanitary Inspector : his initial duties will be to train native boys to make a door, window, bed, table, chair, simple roof, a pit latrine and a rat-proof grain store, to simple designs ; also to lay bricks, make a concrete floor, and set out a simple house to a standard design. The function of the native sanitary assistants thus trained is to guide the domestic revolution, spoken of above, in safe channels and check a tendency toward the development of slums. For " ill health in Africa as in Europe is primarily dependent neither on climate nor on country, but rather on domestic circumstances, and the major campaign must be waged by means of education directed towards the improvement of domestic conditions." Summing up essentials, Dr. Paterson writes :—

" It would appear that the minimum medical and sanitary service required for a large rural African native district [about 100,000] must consist of at least one District Medical Officer, one Medical Officer of Health, one Dispensary Medical Officer, two European Nursing Sisters, one European Sanitary Inspector, possibly European Hospital Assistant and Storekeeper, a sufficient number of adequately trained and disciplined native subordinate

staff, a hospital with accommodation for about 100 patients, and from six to a dozen out-dispensaries ; and, as an essential part of the service, reasonably good housing for the staff."

Finally, the important question is discussed of subordinate African staff.

[In the discussion, which is worth reading, Professor STEPHENS said : " In the case of large populations I do not think you can cure them without educating them first." It is worthy of note that competent thinkers in England have attributed the recent decline in infantile mortality not to the maternity and child welfare centres, but to the Education Act of 1870.]

A. G. B.

MORA (Antonio Damas). L'assistance médicale indigène. [**Medical Service for Native Peoples.**]—*Bruxelles-Méd.* 1928. Aug. 12. Vol. 8. No. 41. pp. 1328–1337. Also in *Bol. da Assistência Méd. aos Indígenas e da Luta contra a Moléstia do Sono.* Loanda. 1928. Jan.–Aug. Vol. 2. Nos. 1–8. pp. 1–13. [1 ref.]

The paper gives a general account of the Portuguese organization of medical service for the native population in their African colonies, and the author draws a sharp contrast between such methods and those adopted by the British. He says all those who took part in the League of Nations tour in 1926 were struck by the lack, in British Colonies, of rural dispensaries, of native sick-nurses and of direct government provision for the medical needs of the natives. These things, the author says, the British leave to missions and private enterprise ; their efforts being indirect, aiming at health improvement through improved economic conditions. He gives prominence to a statement that the British have never been able, nor have they pretended, to assimilate native peoples. [That statement may be accepted, but what goes before is a quite inadquate, indeed a misleading, summary of British medical organization in tropical Africa.]

The system adopted by the Latin races is, says the author, the lineal descendant of the colonizing methods of ancient Rome. " The Romans were *par excellence* the assimilators of peoples. On taking possession of a new country they took command, organized, made roads, took part in all the details of the social life of the conquered, conferred legal rights upon all, the people becoming in two or three generations veritable Roman citizens." The author thinks such a system " theoretically preferable." [Many will think that the Romans were assimilated by the peoples among whom they so industriously mixed themselves.]

The unit of the Portuguese organization is the rural dispensary with native sick-nurse, and consists of treatment room, medical store, consultation room for the itinerant doctor, and shacks for the convenience of patients who require to be kept near the sick-nurse. The whole of this unit is built in native fashion. The only cost to government is for medicaments, food and the rest being brought by relatives.

A slightly more elaborate edition of the same thing serves for the more important villages, and so by steps up to the great modern hospitals of the capitals. [Curiously enough, the first example of the last to be quoted is the native hospital at Accra in the British Gold Coast Colony.]

J. F. C. H.

GILLET (H.). La service médical des sociétés minières du Kasai. (Champs diamantifères du Kasai). [**The Medical Service of the Mining Companies of the Kasai.**]—*Ann. Soc. Belge de Méd. Trop.* 1928. Sept. Vol. 8. No. 2. pp. 233–249. With 12 figs. on 6 plates & 3 folding plans.

The Forminière Company started diamond mining in the Kasai in 1914, and doctors were employed in 1916, but it was not till 1920 that a medical service proper was created. It grew rapidly and in 1927 there were 13 doctors, 1 druggist, 10 agents sanitaires, and 200 native infirmiers, serving 20 hospitals or dispensaries, 42 infirmaries (? sick wards) and one itinerant mission for the prophylaxis of sleeping sickness : and this for an area of 40,000 square kilometres, with 60 stations, 400 Europeans, 25,000 native labourers and 300,000 other natives.

The medical personnel, however, gives only a small part of its time to the employees of the various companies : it treats all natives free and concerns itself with the prevention of the diseases which cause depopulation and ill-health in that region, namely syphilis, ankylostomiasis, leprosy, yaws, smallpox and sleeping sickness. Owing to the temporary character of many of the stations the dispensaries and hospitals have to be simple and inexpensive in addition to being complete and well fitted. The mining areas are divided into medical sectors, served by a doctor or agent sanitaire assisted by black infirmiers. Four points have to be considered—the area of the sectors, the technical and scientific preparation of the medical personnel, the quality of their equipment, and the training of a sufficiency of infirmiers. Experience has shown that the care of 25 or 30 Europeans, some with wives and children, and 2,000 or 3,000 native labourers, collected in 6 or 8 stations on a system of 500 kilometres of motorable roads, is as much as a doctor can undertake, and he must be well trained, well assisted and well equipped. On their arrival in Africa the young doctors and agents sanitaires are posted to the native hospital at Tshikapa. Here the doctors, who have previously taken the course at the school of tropical medicine in Brussels, become acquainted practically with their duties, and are saved the many mistakes they would make if they had to acquire each for himself a knowledge of medical practice in Africa. They learn hospital administration, dieting of patients, management of native personnel, the examination and inspection of labourers and camps, and the like. Two months of this training are more valuable than two years of painfully acquired experience. Hospitals and dispensaries as well as materials are standardized as far as possible. Each doctor is provided with a motor car and a first-aid case containing all he wants for the immediate treatment of any disease.

In the school at Tshikapa the native infirmiers learn their work. The course is given in a native language, lasts a year and consists of theoretical and practical instruction, the latter comprising microscopic examination, minor dressings, administration of common drugs, intravenous injections, temperature taking and ward work. The results are described as encouraging but out of proportion to the trouble taken. The first difficulty is to recruit pupils capable of profiting from the instruction, i.e., with knowledge of reading and writing and some guarantee of character. This overcome, the course eliminates 80 per cent. of the selected. It is not difficult to teach the young native, but to imbue him with notions of duty, devotion to his work and initiative is another matter.

The Centres are standardized. The hospitals are of three types—(1) Native hospital with a good surgical installation, a well-furnished laboratory of microscopy and biology and a dispensary; its capacity is 100 beds; (2) the same installations but with capacity of 60 beds. Each of these is in the charge of a doctor. (3) Installation for minor surgery, a small laboratory with microscope equipment for intravenous or other injections; capacity 20 patients. This type of hospital if managed by an infirmier is designated dispensary. The mining zone contains one hospital for Europeans (type 1), 1 for natives (type 1), these at Tshikapa; 7 of type 2 for natives, 11 of type 3 for natives and 42 "infirmeries" at the mines. Several of the hospitals are not yet finished, but all will be completed in 1929. The object is to treat the greatest number of curable cases rather than to do purely scientific work: and it is gained by organization, specialization, and extensive employment of native infirmiers, and simplification and uniformity of treatment. The hygienic condition of the natives outside the circle of influence of the stations is bad. A table is given of the causes of mortality of 22,850 native labourers in 1927. There were 125 deaths. Of these 32 are attributed to cachexia with intestinal parasitism, 16 to acute lung infections, 16 to grippe, 4 to tuberculosis and 38 to unknown causes (many of these probably grippe). Of the first we are told that the cachexia comes on suddenly without visible cause and is not influenced by treatment or diet; post-mortem examination has failed to elucidate it; there is often ascites. The health of the camps is good. The occupants are medically examined when recruited and kept under medical supervision, treated promptly, while cases of contagious disease are promptly recognized and isolated. The labour is recruited from the district, and is immune to the local viruses, which explains the low proportion of pneumonias. Discipline is not too strict, and the food is comparable with that of the villages from which the natives come, though richer and more abundant. The Europeans are remarkably fit: malaria is mild, and amoebic dysentery remarkably so.

The rest of the paper deals with the organization of each Sector, of sleeping sickness prophylaxis and with a hospital for incurables maintained by a mission and accommodating 120 patients. Here the victims of leprosy and sleeping sickness at the last stage will end their days. The illustrations give a good idea of the character of the buildings, simple plans of which are also shown.

A. G. B.

VAN RIEL. L'activité du centre médical de Tshikapa (Kasaï). [**The Work of the Medical Centre at Tshikapa (Kasai).**]—*Ann. Soc. Belge de Méd. Trop.* 1928. June. Vol. 8. No. 1. pp. 47–56.

Tshikapa (Chipaka of English maps) is the administrative centre of the mining companies in the Kasaï District of Belgian Congo. Dating from 1920 it is now one of the large medical stations. The author has had three years' experience there. He describes the native hospital, where in 1926 there were over 25,000 consultations, comprising both native mine employees and other natives. The employees are examined on engagement, measured and vaccinated, and re-examined monthly with their wives and children. Of 105 deaths in hospital in 1925 and 1926, 20 were due to trypanosomiasis, 21 to pneumonia and 31 to

" misère physiologique " due chiefly to intestinal parasites, ankylostomes or amoebae. The natives are examined for trypanosomiasis at the rate of 5,000 per month and the infected come readily for treatment by tryparsamide or tryponarsyl. In routine examinations 236 cases have been detected by gland puncture and 43 by blood centrifugation ; treatment is controlled by lumbar puncture, of which 523 have been done. Pneumonia is common but less so than in other parts of Tropical Africa ; pneumococcal complications are rare. Tuberculosis will soon, the author says, become one of the plagues of the country. For intestinal parasites all patients are examined who have abdominal symptoms and also all hospital entrants. Of 2,237 stool examinations 1,397 were positive, revealing ankylostomes in 30 per cent., amoebae and amoebic cysts [species not stated] 18 per cent., ascaris 2·8 per cent., schistosoma [species not stated, but the rectal form is named elsewhere] 1·1 per cent. Liver abscess has not been seen. There are also many fatal cases of cachexia with ascites, in which the author suspects a helminth etiology. Enteric fever and bacillary dysentery are unknown. Malaria is frequent but mild. Only one case of relapsing fever has been seen, in a woman from Angola, though *O. moubata* is present. Smallpox has practically disappeared. Leprosy attacks about 3 per cent. of the native population. Yaws is rare in the camps and present in about 2 per cent. of the native population. Syphilis is prevalent in the camps. Both diseases are treated by " Neo " intravenously and Bi36 intramuscularly, once a week ; in children stovarsol is as effective. Tropical ulcer is diminishing in frequency as hygienic conditions improve ; small ulcers are systematically sought, and every tropical ulcer is treated in hospital. *Onchocerca volvulus* cysts and filarial itch are widespread. A list is given of surgical interventions, 945 in all.

A. G. B.

Lhuerre (H.). Les oeuvres de sauvetage de l'enfance à Dakar. [**Child Welfare at Dakar.**]—*Bull. Soc. Path. Exot.* 1928. May 9. Vol. 21. No. 5. pp. 401–411.

The measures comprise a native maternity centre, pre-natal consultations, a baby clinic, gynaecological clinic and a crèche. The maternity centre, inaugurated in 1919, contains 20 beds for lying-in women and 10 for pregnant women at term. It is staffed by a qualified accoucheur, two European midwives and a qualified native midwife from the Dakar Medical School. The pupil midwives assist. There are no infirmiers, all the work being done by the midwives and their assistants. In 1927 there were 441 deliveries, and if the accommodation were sufficient the number could be tripled. Outside, the mortality amongst mothers and babies is extremely high. The mothers leave the maternity centre 11 days after delivery with a layette and 20 francs.

The personnel of the maternity centre provides for the pre-natal consultations which are welcomed by the native women ; in the year 1927, 740 women were seen at 9,653 consultations.

The working of the baby clinic is described ; here, again, the mothers come very readily. The diseases chiefly met with are bronchitis, gastro-enteritis, stomatitis, thrush, conjunctivitis, otitis media, pyodermia, and, above all, malaria and congenital syphilis. No precautions are taken by the natives against malaria, and the belief prevails, among

whites as well as blacks, that a nursing mother has only to take ·25 or 0·5 gm. of quinine hydrochloride to protect her child. Congenital malaria, in the author's belief, is frequent and generally overlooked: to it he attributes the fever and gastro-intestinal symptoms which are so common amongst infants in Dakar. The remedy is a daily dose of quinine during pregnancy. As to syphilis, 45 per cent. of the children up to two years are said to die from it. The success of this clinic may be judged from the fact that in 1927 3,287 babies were seen at over 25,000 consultations.

At the gynaecological clinic the conditions most frequently met with are haemorrhage after delivery or miscarriage, puerperal infection, metritis, parametritis and vesico-vaginal fistula; over 13,000 women were treated in 1927. This is the centre also for antivenereal prophylaxis.

A. G. B.

Lhuerre (H.). Note sur le fonctionnement de l'Institut d'hygiène sociale de Dakar. [**The Institute of Social Hygiene at Dakar.**]— *Bull. Soc. Path. Exot.* 1928. Apr. 18. Vol. 21. No. 4. pp. 329–334.

A further account is given of the working of this Institute, which came into being in June, 1921. It serves two purposes: as a native dispensary and as a school for native doctors and midwives. In 1927 there were 17,405 new patients and 87,723 consultations. The Institute comprises six services: general medicine, special diseases (eye; nose, throat and ear; mouth), antituberculosis service, antivenereal service, service of baths, and bacteriological laboratory. The Institute is responsible for the medical examination of the pupils of the municipal schools, of whom full physical records are kept. By its agency in the year 1927, 1,732 vaccinations against tuberculosis were performed.

A. G. B.

Cook (Albert R.). **Report of the Lady Coryndon Maternity Training School, Namirembe, 1927.**— *Uganda Protectorate Ann. Med. & San. Rep. for Year ended 31st December, 1927.* Appendix No. V. pp. 81–86.

Dr. Cook writes that in the Kingdom of Buganda, which contains the most enlightened people of the Protectorate, the maternal mortality is estimated to be 4 per cent., or ten times the figure in England. The elimination of three factors would probably bring the Uganda mortality below the English figure, these being syphilis, contracted pelvis and native medicine. In syphilis antenatal treatment is having great success. Of contracted pelvis, Dr. Cook writes:—

"The simple flat pelvis is the type most commonly met with, due to the practice of putting heavy loads of water pots or bananas on the heads of young girls when the pelvic bones are still plastic. The weight transmitted down the vertebral column forces the sacral promontory forwards and downwards and reduces the all-important anterior-posterior diameter of the pelvis. As rickets is virtually unknown among the Baganda, this factor is of considerable importance. About 18 per cent. of Baganda women show pelvic contraction."

The third factor is the most serious of the three. In almost all cases of impending delivery the old women prepare a decoction of native herbs with powerful oxytocic properties which the unfortunate patient

has to drink, and in many instances a normal labour becomes a dangerous one. In a series of 19 deaths in labour 8 were attributed to the use of native medicines, and in 4 instances the uterus was ruptured. The remedy is education.

A table shows that there were, in 1927, 23,000 out-patient attendances at the training school, 2,362 new patients, 67 per cent. of whom had a history of syphilis, and that 1,035 babies were born. Of in-patients in the clinical wards attached to the training school there were 775 admitted during the year, 589 confinements and 19 maternal deaths. In 15 Maternity Training School Country Centres there were 1,543 confinements, with 1,444 living children and 9 maternal deaths. Thirty-two native students were in training at the School and 65 have qualified as midwives after a two-years' course; the service is popular. Full records are kept of all cases admitted. There is also a Maternity Training School at Nsambya, of which details are given by the Revd. Mother M. Kevin.

A. G. B.

Dake (W. J. L.). Die Bedeutung der Pathologie der Tropen für die Lehre der kosmopolitischen Krankheiten. [**The Significance of Tropical Pathology for the Study of Cosmopolitan Diseases.**]—*Wien. Med. Woch.* 1928. Sept. 8. Vol. 78. No. 37. pp. 1160–1162. [10 refs.]

The author's text is a table of incidence of diseases seen in hospitals in Batavia and Sourabaya during three years, which shows that some diseases frequent in Europe are in Java rare; e.g., exophthalmic goitre was seen only four times in 47,000 patients. He surveys work done in the Dutch East Indies on the differences between the pathology of the temperate and tropical climates.

As to morphological differences, the diameter of the aorta is less in the Malay than the European, 3·1 to 4·2 cm., and the thyroid is much smaller; on the other hand, the hypophysis is larger in the Malay.

Several authors have made a study of the blood. The percentage of lymphocytes is high in Malays, as are the numbers of red corpuscles and the haemoglobin (5,200,000 and 104 per cent. Sahli); the iron content is also higher. The cholesterin content is lower, as has been shown to be the case in British India and Indo-China; the residual nitrogen and urea are less, the phosphorus more.

Gall-stones are rare in D.E.I. and when they occur the stones are in the bile-ducts, composed of bilirubin and poor in cholesterin; this de Langen associates with the poverty of the blood in cholesterin, and this again is probably associated with the cholesterin-poor diet. Bladder stones, however, are not infrequent, another possible result of diet for it has been shown that a diet deficient in vitamin A will produce them in rats. He draws attention to the frequency of lobar pneumonia (2,214 cases in the 47,000) and to that of liver cirrhosis (150 cases); in the last alcohol plays no part. Liver carcinoma comes high among the malignant tumours and of these cases 90 per cent. have cirrhosis.

De Langen believes that in tropical conditions there is greater irritability of the sympathetic nervous system, to which he would attribute the rarity of gastric ulcer and gout. Van Loon thinks that the neurasthenia of the tropics is shown much more than in Europe by somatic phenomena—abnormal secretion of sweat, attacks of diarrhoea, rhinitis—which can be explained by heightened irritability or paralysis of the vegetative nervous system.

Obliteration of the vermiform appendix is common in Europe, rare in Java ; in a large proportion of native cases the natives had adopted European habits. In the mission hospital at Bandung the author had no cases of appendicitis among 5,000 patients. The rarity of tabes and G.P., though syphilis is common, is again commented on.

[Most of the papers referred to have been summarized in this *Bulletin.*]

A. G. B.

Nocht (B.). Organisation und Arbeit des Instituts für Schiffs- und Tropenkrankheiten. [**Organization and Work of the Institut für Schiffs- und Tropenkrankheiten.**]—*Klin. Woch.* 1928. Sept. 16. Vol. 7. No. 38. pp. 1795–1799. With 1 text fig.

An account of the work of the several departments of the Hamburg Institute from 1905 to the present day. It is packed with information and will be useful for reference. Though Germany is without tropical possessions the Institute maintains its usefulness.

A. G. B.

Stephens (J. W. W.). **The Functions of the Spleen.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Nov. 25. Vol. 21. No. 3. pp. 161–184. With 11 text figs. [51 refs.]

A presidential address packed with diverse, and often differing, observations on all phases of its subject. It is as little capable of summary as Bradshaw's Railway Guide. To indicate its scope it may be mentioned that the main headings are : General Anatomy ; Circulation ; Haemopoiesis ; Haemolysis ; Splenomegaly ; Splenectomy.

A. G. B.

Barrett (James W.) ; Balfour (Andrew). **Tropical Australia.** [Correspondence.]—*Brit. Med. Jl.* 1927. Dec. 31. p. 1244 ; 1928. Jan. 7. p. 30 ; May 5 & 19. p. 772, 875 ; July 28. p. 176 ; Nov. 3. p. 818.

This correspondence relates to Tropical Queensland. Sir James Barrett's thesis is that Queensland's experience, as far as it goes, shows that one part at least of the tropics can be peopled by a white race, and this he attributes to the absence of a parasitized native population. As to heat, " nearly three-quarters of a century of settlement in tropical Queensland indicates that no serious organic damage need be anticipated." Dr. Balfour finds it difficult not to believe that tropical light and heat tend to affect deleteriously the nervous systems of northern European races constantly exposed to them. He has been told, however, that the white men who work in the cane fields are largely of Italian origin, and asks whether this is really the case.

" Is there in the low-lying region of tropical Queensland an example, on a comparatively large scale, of a colony of British-born settlers which has persisted without deterioration for three or four generations, and the male members of which have carried out manual labour in the open ? "

Sir James Barrett replies by giving the statistics of Italians or Italian-born persons in Queensland for the census years from 1871 to 1921, in which year it was 2·44 per mille, and that portion residing within

the tropics 8·37 per mille of the tropical population. Dr. Balfour being dissatisfied with his reply, Sir James Barrett writes that the precise answer to his question cannot be given till the census of 1931. Dr. Cilento, however, informs him that in the tropical coastal belt of Queensland the population is 103,000, of which Italians [? and Italian born] formed less than 1 per cent., that is, between 850 and 900. By 1927, however, owing to American restrictions to immigration, there were 7,000 more, bringing the Italian component of the population to 7 per cent. " On sugar production as a whole there are 30,250 men employed, and of these the Italians number 2,700, or about 9 per cent," but up to 1921 sugar growing was conducted by Anglo-Saxon labour almost exclusively.

A. G. B.

Koningin Wilhelmina Jubileum Stichting. Vierde jaarverslag 1927. [**Queen Wilhelmina Jubilee Institution. Fourth Annual Report. 1927.**]—27 pp. G. Kolff & Co., Batavia–Weltevreden.

This institution exists for the purpose of promoting scientific medical research in the Dutch East Indies, especially in regard to the combating of endemic diseases. The Queen has given to it funds contributed by the population of the D.E.I. on the occasion of her jubilee coronation in 1923. The activities of the institution during 1927 are very briefly summarized. Subsidy was granted to workers in various branches of research (malaria control, tuberculosis of the throat, tropical ulcer, goitre, physiological subjects). For the prize subject, spread of tuberculosis in a limited free-living population in a part of the D.E.I., five answers came in. Two prizes were granted, to Dr. Paneth for his research among the Batak population in Sumatra, and to Moh. Djamil, whose research concerned the population of two villages in the hills of West Sumatra. Both reports are to be published in detail. The Committee decided to have a medal made, to be awarded to workers who distinguish themselves in the combating of endemic diseases.

W. J. Bais.

Hötte (F. A.). Koningin Wilhelmina Gasthuis voor Ooglijders te Bandoeng. Jaarverslag over 1927. [**Queen Wilhelmina Hospital for Eye Patients at Bandoeng. Annual Report for 1927.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1928. Vol. 68. No. 4. pp. 572–578.

6,402 patients were treated at the polyclinic with 38,019 consultations; the average number of patients was 125 per day. 1,174 operations were performed. By a temporary stitch through the M. rectus superior, by paralyzing the m. orbicularis with novocain, cutting the eyelashes short, disinfecting the margin of the lids and continual dipping [? swabbing] of the conjunctival sac in order to keep it dry, the danger of infection in cataract operation could be reduced to a minimum. Tarsoplasty is done after Blascovics. No strabismus operation had to be done; the natives do not ask for it. The late and neglected stages in which many cases come under treatment may be discouraging for the tropical opthalmologist; on the other hand, he can dispose of a large operative

material. The author finally shortly quotes the occurrence of a familiar type of degeneration of the cornea and a case of luxation of the lens as a sequel of trauma of the head.

W. J. Bais.

GALT (Curtis M.). **Diseases Prevalent in Kiulungkiang, Yunnan.**—*China Med. Jl.* 1928. June. Vol. 42. No. 6. pp. 420–422.

The author refers to WATSON'S paper on medical practice in Yunnanfu [this *Bulletin*, Vol. 25, p. 368]. Kiulungkiang is in south-western Yunnan on the banks of the Mekong river at 1,500 feet. Racially, the population is Siamese. The diseases seen are: vesical calculus (common), bronchial asthma (very common), measles, amoebic dysentery, smallpox, malaria (very common), leprosy (very common), tuberculosis, rat bite fever (2 cases), acute rheumatism, goitre (fairly common), trachoma and cataract; intestinal parasites are extremely common, especially tapeworm, ascaris and hookworm, but the eggs of the last are never numerous.

Diseases not seen: lobar pneumonia, tonsillar disease, tetanus, epidemic meningitis, typhus, typhoid, relapsing fever, cholera, plague, anterior polyomyelitis, epidemic encephalitis.

A. G. B.

BAKER (John R.). **Depopulation in Espiritu Santo, New Hebrides.**—*Jl. Roy. Anthropological Inst.* 1928. Jan.–June. Vol. 58. pp. 279–303. With 2 figs. & 1 plate. [7 refs.]

The author has paid two visits to this island, and spent the year 1927 in making a general study of it. He devoted particular attention to the Sakau peninsula, and traversed it in all directions, mapping the existing and deserted village sites.

He found that the total population of Sakau was 691, but as no previous census has been made it is not possible to give any facts relating to the course of the depopulation; but there is ample evidence that the decrease in the number of inhabitants has been very rapid, and still progresses. In considering the cause of the depopulation, the author mentions the work of previous writers, some of whom gave currency to views which are obviously untenable. He believes that there are three principal factors: (1) *Introduced diseases*—Measles, whooping cough and mumps reduced the population of two villages in West Santo from 278 to 32, and this instance does not stand alone. Other diseases, believed to be introduced by shipping and frequently fatal, are influenza, dysentery and tuberculosis. Depopulation is very great in places where no foreign influence except introduced diseases has exerted itself (see below). (2) *Abortion*—Baker feels certain that this is commonly practised [and I entirely agree with him], but no one has produced direct evidence that it is so. The fact that there are only 128 living children per hundred adult females, nearly all of whom are married, appears to confirm the general belief that abortion is commonly practised. (3) *High Sex-Ratio*—in Sakau there are 159 males per 100 females, a ratio which is higher than any other on record, except the ratio of 161 in the Anir Islands, Bismarck Archipelago, recorded by PITT-RIVERS. These abnormal sex-ratios, and others

recorded from many but not all parts of Melanesia, are not due to female infanticide, for it is known that they exist at birth in certain islands ; they are clearly a potent cause of depopulation.

The author rejects the view propounded by RIVERS, that the destruction of old customs and occupations produces apathy, of which the people die. He is one of the few white men who have penetrated the heathen interior of the Sakau peninsula where there is no direct European influence of any kind, and there he found that there were 120 children per 100 adult women ; in contrast to this, he found 164 children in the Christian villages, where many of the old usages and amusements have been stamped out. He concludes that " it is not loss of old customs which is causing the people of Santo to limit their families by abortion."

The whole paper is of great interest and value, especially because the author has been at pains to collect facts rather than theories.

P. A. Buxton.

LAMBERT (S. M.). **Medical Conditions in the South Pacific.**—*Med. Jl. Australia.* 1928. Sept. 22. 15th Year. Vol. 2. No. 12. pp. 362–378. With 6 graphs & 1 map.

For ten years Dr. Lambert has served the International Health Board in the South Pacific, that is to say, in those innumerable islands which lie south of the Line, to the east of New Guinea. In these years it is certain that he has travelled more widely than any other student of the health and welfare of the peoples of Melanesia and Polynesia ; and within his interests he includes not only many sides of medicine and practical hygiene, but also an acquaintance with the anthropology and the work of early European travellers in the Pacific. In British Oceania he works as a friendly critic, preserving an external point of view, and in the paper before us he summarizes his observations and gives a general review of our problems, successes and failures.

In the Pacific, perhaps more than in any other part of the world, we may arrange our knowledge of disease and hygiene around human history and movements. In that part of the world with which Dr. Lambert is concerned, there are two principal human races, Melanesians towards the west and Polynesians in the centre of the Pacific. In nearly every respect these peoples present great contrasts to one another, for the Melanesians speak a multitude of unrelated tongues, and each community tends to live by itself, quarantined from the next by differences of language and culture and by unseen barriers of magic and fear ; whereas Polynesians are one in race and spirit, and until the coming of the European their unity was maintained by continual travelling and raiding. But though the races are so different, they both came into Oceania from the west, following several routes, and in doing so they passed from a part of the world which is rich in diseases and parasites to a part which, even now, is relatively free from both ; and as they crossed the ocean from archipelago to archipelago they shed some of the parasites and diseases. For instance, when they crossed the sea between the New Hebrides and Fiji, roughly 170° east of Greenwich, they left behind them Anopheles and Plasmodium ; at or about the same place they freed themselves of venereal granuloma. The same is true of food plants ; there is no sago or betel east of the Bismarcks, and in the atolls of the central Pacific kava,

yams and many other crops will not grow. On the other hand, in all parts of Oceania Necator and Trichuris are universal and everywhere, with one possible exception, the natives suffered from yaws.

There are, it must be admitted, a few facts which cannot be explained in terms of human migration. One of these is the almost total absence of *Entamoeba histolytica* and of clinical amoebiasis from these countries [Dr. Lambert is in error when he says that this condition occasionally occurs in Samoa] ; the absence of Cestodes and Trichinella is also unexplained ; indeed, it is most unexpected, for the early Melanesians and Polynesians possessed domestic dogs and pigs, and a small rat travelled with them from island to island.

The islanders lived with few diseases and parasites, till the white man made his first settlements, in the early years of the last century. He brought with him a number of diseases which we believe did not previously occur in Oceania, and his arrival was followed by outbreaks of dysentery, measles, and other exanthemata ; the tuberculosis, gonorrhoea, leprosy, and enteric were less apparent, but none the less harmful to the native races. The economic development of Fiji, Tahiti, the New Hebrides and other islands was brought about by cheap Oriental labour, and the Chinese, Indians and Annamites introduced leprosy, Ascaris and Ancylostoma. Soon after the European arrived the native races began to decrease in numbers.

The Pacific of which Dr. Lambert writes has passed that stage ; nearly everywhere the numbers of natives are increasing, or at least not decreasing. The introduced diseases are coming under the control of the foreigner's medicine and hygiene ; in the more enlightened parts of Polynesia there are organized campaigns against yaws, ankylostomiasis, and the maladies of infancy, and in many places a notable reduction in child mortality has followed. As the author points out, the much-attacked Medical Department of Western Samoa planned and executed an admirable demonstration of preventive medicine, and the country was reaping the results of it until the recent political trouble destroyed the work of several years.

In the south Pacific, the administrator's greatest difficulty is that his people are scattered and live in minute communities ; the Fijians inhabit 250 islands, and the atoll folk in the Ellice and Tokelau groups live on sand-banks, each one fifty miles or so from the next. Under these circumstances, it is impossible to provide an adequate medical service of Europeans, and native medical practitioners have proved their worth for many years in Fiji. The custom has been to train these men for three years in the central hospital at Suva, and send them out to the districts ; on the whole they have a very good name among natives and Europeans ; in character and boldness they are utterly unlike the subordinate medical personnel of some other tropical countries. It is now some years since the value of men of this type was realized, and the Rockefeller Foundation has associated itself with the local administrations in enlarging the buildings and the scope of the school attached to the Suva Hospital. The new buildings are now open ; they house forty students drawn from the seven important archipelagoes in Polynesia, and Melanesia. The men who have gone through the School will return to their homes, and are perhaps destined to be the most important liaison between white and brown races.

With these matters and many others Dr. Lambert's paper deals, and on the whole it is a very well balanced summary. If we may criticize his work we should say that he gives currency to too many

generalizations, and that his attitude is uncritical. The medical men in the Pacific are thinly spread over a vast area ; few are in touch with centres of intellectual work, and most are overwhelmed by their opportunities ; some of the statements which appear in their reports require to be investigated before they are put into circulation. For instance, it has often been stated, and Dr. Lambert repeats it, that diphtheria occurs and is mild ; but does it occur at all ? What real grounds are there for thinking that New Caledonia and the New Hebrides have much amoebic dysentery ? In one archipelago in the Central Pacific it is customary to excise enlarged glands, literally by the thousand ; it is assumed that the glands are tuberculous [the reviewer believes that they are due to yaws], but it is not evident that smears or sections have been examined for the tubercle bacillus ; we wish that Dr. Lambert had boldly raised the question. CILENTO's figures from New Guinea are quoted as showing that in natives newly recruited for plantation work, 5 per cent. had a positive von Pirquet reaction, and that the percentage rose (accurate to one place of decimals), and reached between 63 and 70 per cent. in those who had worked for the white man for ten years. But if one refers to the original paper it is not clear that all the facts were collected by one man, or from a homogeneous group of natives, and as no original figures are quoted we are left to assume that these exact percentages are justifiable. Dr. Lambert rightly calls attention to the urgent need for vital statistics properly collected ; we feel that he would have conferred still more benefit had he laid bare some of the other gaps in our knowledge, and some of the points where its foundations are insecure.

P. A. Buxton.

NICOLAS (Ch.). Etude des causes de la disparition progressive d'une intéressante race d'indigènes. [**Study of Causes of Depopulation of New Caledonia.**] —*Bull. Soc. Path. Exot.* 1928. June 13. Vol. 21. No. 6. pp. 453–465.

In the year 1887 the native population of New Caledonia was approximately 42,000, and it diminished to 26,915 by the year 1926. During this period the rate of loss per cent. per annum has lessened, for the figure stood at 1·75 in 1887, and has now fallen—apparently steadily—to 0·72. In other words the depopulation continues, though it is less rapid than it was, and it is much less rapid than it is in some other parts of Melanesia.

Dr. Nicolas discusses some of the possible causes of loss of population. He thinks that, in the period prior to about 1887, excessive and unwise consumption of alcohol was a cause of loss of life, but that it is not so to any great extent at the present day. He does not believe that either syphilis or tuberculosis are important. In common with most authors who have studied Melanesia, he believes that abortion is commonly brought about by the use of certain vegetable poisons, but it is not easy to see that this practice can account for the rather dramatic loss of population which has occurred in the last half-century particularly. He holds that the principal cause of loss of population is in-breeding ; and this he attributes in part to the institution of Christian marriage and Christian monogamy ; in part to Government regulations which prohibit, or tend to prohibit, the free movement of

natives from one part of the island to another; and in part to the abolition of wars and raids, which in the old days were accompanied with much free mingling of natives of different villages and tribes.

[Dr. Nicolas has been for twenty-one years a doctor in the native department of New Caledonia, and he has the problems and difficulties of the native race very much at heart. His opinions are, therefore, to be received with respect and attention, but in one or two ways his paper is open to criticism. It contains an insufficiency of hard fact, relating either to the loss of population or to the common diseases of the country. Moreover, he does not distinguish between the diseases which are native to the country, and those which have been introduced by the European comparatively recently: but this distinction is vital, for it is clear that the depopulation is a recent phenomenon and in some way associated with the arrival of the European. There are two topics which he has failed to discuss. He makes no mention of the very important fact that in New Caledonia, as in so many parts of Melanesia, the sex-ratio is quite abnormal, a very high proportion of males existing in the population as a whole. He fails, also, to speak of the remarkable contrast between the east side of New Caledonia, which is exposed to the trade winds and receives a constant and abundant rainfall, and the west side, which is sheltered from wind and rain by a high range of mountains. This difference in climate is accompanied by a striking difference in vegetation and also, one might assume, in salubrity.]

P. A. Buxton.

i. Kritschewski (I.) & Schapiro (S.). Ueber die Natur der Immunität bei Rückfallfieber. III. Die Antikörper als Schutzapparate des Organismus bei Rekurrens. [**The Nature of Immunity in Relapsing Fever. III. Antibodies as Protective Factors.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1928. June 4. Vol. 56. No. 3–4. pp. 308–321. [Refs. in footnotes.]

ii. —— & Schwarzmann (L.). Die Bedeutung des retikulo-endothelialen Apparates bei Infektionskrankheiten. I. [**Significance of the R.E. Apparatus in Infectious Diseases.**]—*Ibid.* pp. 322–329. With 4 charts in text. [12 refs.]

iii. Lisgunowa (A. W.). Ueber die Natur der Immunität beim Rückfallfieber. IV. Das Verhalten des retikulo-endothelialen Systems der Ratte bei der Mischinfektion mit Recurrensspirochäten und *Bartonella muris*. [**Behaviour of R.E. System of Rats in Mixed Infection with Recurrence Spirochaetes and** *Bartonella muris*.]—*Ibid.* Sept. 24. Vol. 58. No. 1–2. pp. 93–98. [1 ref.] [Microb. Research Inst., Education Commissariat R.S.F.S.R., Moscow.]

i. In the first of these new studies by Kritschewski and his collaborators the question is raised how far the protective functions exercised by the R.-E. system in recurrens infection depend on phagocytic action by the R.-E. cells or on antibody (lytic) action. Previous experiments had shown that splenectomy in conjunction with blockade caused over 90 per cent. of white mice to succumb to *S. duttoni* infection. The authors set out to determine (1) whether, with an intact R.-E. system, the destruction of spirochaetes and recovery from infection ran parallel with antibody-development and (2) whether in the event of such parallelism being demonstrated, the production of antibodies proceeded when the R.-E. system was cut out. Rats were

employed for these experiments. At various periods after infection the animals were bled and their sera tested for lysin-content by injection of mixtures of serum and mouse blood containing *S. duttoni* into several normal mice. Normal rat sera were tested similarly as controls. The results showed that only after the acme of the infection was passed did lysin begin to appear in the serum of animals with intact R.–E. system. As recovery progressed the lysin content increased to such extent that all mice inoculated with the mixtures of serum and infective mouse blood survived. Having decided that in normal rats destruction of spirochaetes and recovery coincided in time with maximal lysin-development, the authors now performed splenectomy experiments. Splenectomized rats were found to succumb regularly to infection with *S. duttoni* and it was noted that the serum of the animals taken during the agonal period contained no lysin. What then would be the effect of administering lysin-containing serum to such splenectomized rats? Would it lead to cure? If it did, it would show that cure was essentially a function of lysin-production and not of phagocytic action or intracellular destruction of spirochaetes. Experiments designed to test this point showed that if lysin-containing serum was given simultaneously with the infecting dose to splenectomized and blockaded animals or therapeutically during the course of infection, it saved the animals which thus behaved as if the R.–E. system was intact. The conclusion was reached therefore that the protective function of the R.–E. system in recurrens infection depended not on phagocytosis of spirochaetes by the R.–E. cells, but on the "secretion" of lytic antibodies.

ii. The second communication deals with an investigation on very similar lines of experimental infections in mice due to *T. gambiense*, *Schizotrypanum cruzi* and *S. morsus muris*.

In these infections there was little or no evidence that the R.–E. system played the part of a protective mechanism as in recurrens infection. Full tables of protocols accompany both papers.

iii. The third paper recounts a reinvestigation of the effect of splenectomy on rats infected with recurrens in view of recent work showing that splenectomy in rats has the effect of bringing to light a latent Bartonella infection if such be present in the strain of rat employed. To get over the difficulty that deaths in splenectomized animals might be to some extent a consequence of the anaemia following Bartonella infection, they gave neosalvarsan to rats one week before the splenectomy. This apparently inhibited the activation of Bartonella by the splenectomy and in such protected animals recurrens infection took a regularly fatal course. Their previous thesis would therefore stand.

J. C. G. Ledingham.

i. Lisgunova (A. W.). Ueber noch unbekannte Funktion des retikulo-endothelialen Systems. IV. Die Beziehungen der Chemotherapie und der Chemoprophylaxis zum retikulo-endothelialen System der Ratten. [**Relation of Chemotherapy to the R.E. System of Rats.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1928. Aug. 8. Vol. 57. No. 3–4. pp. 292–300. [3 refs.]

ii. Kritschewski (I. L.). Ueber noch unbekannte Funktion des retikulo-endothelialen Systems. V. Der Mechanismus der die Aktivität des chemotherapeutischen Effektes bestimmenden Funktion des retikulo-endothelialen Systems und ihre Unabhängigkeit von der Schutzfunktion. [**Mechanism of the Function of the R.E. System which determines the Activity of the Chemotherapeutic Effect. Its Independence of the Protective Function.**]—*Ibid.* Vol. 59. No. 1–2. pp. 1–16. [Refs. in footnotes.] [Microb. Research Inst., Education Commissariat R.S.F.S.R., Moscow.]

i. The first of these papers contains an account of experiments designed to test the influence of splenectomy on the chemotherapeutic and prophylactic action of various drugs in trypanosome-infected rats. The experiments really constitute an extension to rats of previous work of a similar kind carried out on mice (see previous reviews of work from the Moscow Laboratory). The findings support those made previously in mice. Splenectomized rats receiving germanin therapeutically at various periods after infection, from 48 hrs. to 120 hrs., lived 2–5 days while the controls lived 14 days. In prophylactic experiments with neosalvarsan the splenectomized animals lived 16 days as against 29·8 days for the controls. They conclude therefore that the R.-E. system possesses the special function of determining the efficacy of the therapeutic agent.

ii. In this paper Kritschewski presents two new series of experiments designed to test the truth of his theory that an intact R.–E. system is indispensable for the efficient working of a chemotherapeutic remedy. If the drug has to be absorbed by the R.–E. system in the first instance and possibly modified in the process, then perhaps the incorporation of the drug in agar (6 per cent.) instead of in salt solution, and the injection of the drug-agar mixture into the subcutaneous tissues or the muscles, might compensate for the environment that is lost in the splenectomized animal. Tabulated experiments show, indeed, that in the splenectomized animals the effect of the drug is much enhanced when administered in combination with agar. Apparently, therefore, in the absence of a spleen the slow discharge of the drug from the drug-agar mixture plays a useful part. In a second series of experiments the drug was digested with the trypanosome-containing blood *in vitro* before injection into the splenectomized animal. The loss of the spleen in this case made no difference to the efficacy of the drug. Full protocols displaying the experimental data accompany the paper.

J. C. G. Ledingham.

Tonietti (Francesco). La prova della tetracloro fenolftaleina con speciale riguardo alle alterazioni dell'apparato reticolo endoteliale e alla malaria. [**The Rosenthal Test with Special References to the Changes in the R.-E. System and to Malaria.**]—*Policlinico Sez. Med.* 1928. Oct. 1. Vol. 35. No. 10. pp. 572–580. [16 refs.] [Inst. of Clin. Med., Univ., Rome.]

Tonietti discusses here the various pathological conditions in the course of which a positive Rosenthal test may be obtained. This injection test was originally designed to afford an index of the functional activity of the liver. Among the diseases investigated by Tonietti were eight cases of malaria all of which gave strongly positive Rosenthal

reactions and the author, in view of the fact that in malaria the R.–E. system is profoundly altered, is inclined to regard the test as equally an index of the functional activity of this system. The particular product used for the test was the Tetrachlorofenolftaleina sodica or Merk's "Clorotetragnost."

J. C. G. Ledingham.

Feldt (Adolf) & Eisenmenger (Clara). Die Rolle des Reticuloendothels beim chemotherapeutischen Heilungsvergange. II. Mitteilung. [**The Rôle of the R.E. in Chemotherapeutic Curative Processes.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1928. Dec. 15. Vol. 109. No. 2. pp. 410–426. [7 refs.] ["Robert Koch" Inst., Berlin.]

This paper deals with certain controversial points which have arisen in connexion with previous reports on this subject by the authors and by Kritschewski and Jungeblut (see previous reviews). Kritschewski and Rubinstein and also Jungeblut had found that experimental recurrens infection of splenectomized mice had a disastrous effect on the course of the disease, a very high mortality resulting. Feldt and Eisenmenger now claim to show, though the evidence is not quite convincing, that by employing satisfactory animals not subject to intercurrent infections, and by improved methods of spleen removal, it is possible to get a similar reaction to recurrens in splenectomized as in normal mice.

The remaining portion of the paper deals with experiments which, in the authors' opinion, disprove the previous contention of Kritschewski and of Jungeblut, as the result of their chemotherapeutic efforts in splenectomized animals, that the R.–S. is the tissue in which oxidation of salvarsan takes place and in which the oxide becomes the true parasitotropic substance. They find that, however well based this theory may be so far as trypanosome infections of rats are concerned, it does not hold for recurrens infection.

J. C. G. Ledingham.

Dugdale (J. N.). **"Burning Feet" and other Problems in Estate Medical Practice.**—*Malayan Med. Jl.* 1928. June. Vol. 3. No. 2. pp. 74–76.

The patients who complain of "burning feet" are mostly middle-aged, ill-nourished coolies who have been in the country months rather than years. There is no redness and, rarely, swelling, but sometimes marked engorgement of the blood vessels; wasting is generally seen. There is associated peripheral neuritis. Many coolies are repatriated each year. The cause or causes are obscure, but food deficiency is a likely factor. Sir David Galloway said he had been familiar with "burning feet" for forty years. He would call it "a neuritis due to the combined effects of malaria and some vitamin deprivation."

["Burning of the feet" in Indian sepoys was described by Assistant Surgeon Malcolmson of the Madras Medical Establishment in a book published in 1835.* It came to light in Madrasi sepoys employed in

* Malcolmson (John Grant) [Assistant Surgeon, Madras Medical Establishment.] Observations on Some Forms of Rheumatism prevailing in India. (pp. 32–55). 1835. Madras: Printed by Order of Government. Vepery Mission Press.

the Burmese War at Ava on the Irawaddy and in the Straits of Malacca, not till they had been some time in the country, where the climate is moist compared with Madras. It was most severe under conditions of fatigue and exposure and the subjects were liable to sloughing ulcers. The ration consisted of rice, two ounces of ghee, a little salt fish and spices. It was considered to be distinct from the " common rheumatism " of India and from beriberi.

Whether this is the same condition as that described in Malaya or not, it is to be hoped that Dr. Dugdale will put on record a detailed study of " burning feet."]

A. G. B.

COOPE (A. B. Jesser). **" Burning Feet."** [Correspondence.]—*Malayan Med. Jl.* 1928. Sept. Vol. 3. No. 3. p. 129.

The experience of the author, who writes from Johore, is that " burning feet " is confined entirely to Tamil coolies, and appears in periodic waves especially at times of economic stress. At the same time night blindness is observed, and there is evidence of scurvy—swollen gums, emaciation, harsh, dry scaly skin, variation in pigmentation, cracks in lips. Antiscorbutic treatment is completely successful. Immediate relief to the pain is given by immersion for long periods in hot water, or hot 1 in 20 carbolic lotion. He believes that scurvy in varying degree is more prevalent among Indian coolies than is generally recognized.

A. G. B.

CHOPRA (R. N.), DIKSHIT (B. B.) & DAVID (J. C.). **A Comparative Study of the Action of Cinchonidine and Cinchonine on the Heart.** —*Indian Jl. Med. Res.* 1928. July. Vol. 16. No. 1. pp. 125–133. With 24 figs. on 7 plates. [10 refs.] [Calcutta School of Trop. Med. & Hyg., Calcutta.]

" (1) Intravenous injections of cinchonidine in animals produce a marked depression of the amplitude of auricular and ventricular contractions accompanied by a fall of blood pressure. The irritability of the myocardium is markedly decreased, the latent period and the refractory period are both lengthened.

" (2) Cinchonine produces an apparent stimulation of the auricle and a depression of the ventricle. The former effect is shown to be produced by depression of the inhibitory nervous mechanism and the latter by direct action on the heart muscle. The irritability of myocardium is decreased but not to the same extent as with cinchonidine. The latent period is not increased in frog's heart muscle and the refractory period is not appreciably affected.

" (3) Both cinchonine and cinchonidine temporarily restore the normal rhythm of the heart after it is experimentally made irregular with aconitine. This is partly due to the depression of the vagal mechanism and partly to direct depression of the heart muscle.

" (4) Our experiments show that the laevo-rotatory alkaloid cinchonidine has a more powerful depressant action on the heart muscle than the dextro-rotatory cinchonine."

C. L.

REVIEWS AND NOTICES.

MEXICO. Departamento de Salubridad Publica. **Primer censo de la lepra.** [First Census of Leprosy.]—503 pp. With 31 maps, 1 folding coloured map & 1 folding chart. 1927. Mexico.

This imposing volume contains a mine of information on the subject of leprosy in Mexico. It is a first census and the scheme on which it has been carried out is such that future records will be very largely a mechanical process based on these foundations. Several hygienic questions have been considered by the Public Health authorities of Mexico of late, such as the prevalence of Anopheles and malaria, statistics on tuberculosis and on cancer, but it was found that on so important a disease as leprosy there was almost total ignorance. Information was asked for in the form of a questionary sent to every practitioner in each of the States, relating to 1,232 municipalities, also to the various Governors, local health bodies, hospitals, asylums, clinical laboratories, schools, prisons and reformatories.

The results have been embodied in the present work, which is the outcome of the labours of Dr. J. GONZÁLEZ URUEÑA, the Director of the Public Health Department.

Each State has a section to itself and in the section is given a list of the medical men, hospitals and other institutions, and municipalities to which the circular was sent. The replies [many, unfortunately, sent no reply and this naturally is the fly in the amber] in each case are gathered together in a tabular statement, giving the name of the municipality, the total number of lepers in it, the number of each form (nodular, anaesthetic, or mixed), the age and sex of the patients, whether married, single, or widowed, the place of birth, place of acquirement of the infection, the age when symptoms first made their appearance, whether contracted by contact, the character of the food generally before symptoms were first noticed, the nature of the lesions, and, lastly, a column for observations which are very informative in most instances.

Several censuses of the population have been taken during the last 20 years, but according to Dr. Gonzalez the most reliable is that of 1910, when the total inhabitants numbered 15,160,369. The lepers found totalled 1,450 which on this basis would be about 1 to every 10,450. In the present investigation, however, the number of persons dealt with amounted to less than half the estimated total, namely 6,956,657, which would raise the proportion to 1 in 4,797—clearly a more correct figure. No cases were found in the State of Tlaxcala, a small state of only 184,171 inhabitants : Jalisco, with a population of 1,208,855, of whom only 510,623 came into the present leper-census, headed the list with 237 cases, or 1 to 2,152 of the smaller census, 1 in 5,100 of the entire population according to the former census.

Of the 1,450 cases, 795 were males, 456 females : in the remaining 199 the sex was not stated. 734 were of the nodular form, 262 nervous, 253 mixed, the remainder not known. As regards age, 352 (24·3 per cent.) were in the third decade, 214 (14·7 per cent.) in the fourth, 212 (21·5 per cent.) in the fifth. 507 were single, 428 married, 116 widowed, the state of the remainder (399) in this respect being unknown.

As regards the mode of infection, 359 traced theirs to direct contact, 197 denied any association, and 96 attributed it to heredity. No information was given in 798 cases. The question of diet was asked with a view to ascertaining once again whether fish-eating had any connexion with the disease. The answers lent no support to the theory. Of 880 cases 301 lived mostly on pork and rarely ate fish : 24 only preferred the latter : 501 partook of both.

The work terminates with tables of the collected figures and a map coloured to show the degree of prevalence of the disease in different parts of Mexico.

It was probably hopeless from the first to expect complete success in such a large undertaking, but it seems a pity that so many medical men failed to

reply to the questions asked, that only 45·8 per cent. of the population (as estimated by the 1910 census) were investigated.

The defects of the record, however, can in no way be laid to the charge of the Director of the Public Health Department, whose energy enabled all this work to be done in the course of two and a half years. It is a pleasure to read a Spanish work so well got up and so well printed.

H. Harold Scott.

Bose (J. P.) [M.B., (Cal.), F.C.S. (Lond.), Research Worker on Diabetes, Calcutta School of Tropical Medicine & Hygiene; Physician, Carmichael Hospital for Tropical Diseases, Calcutta.] **A Handbook on Diabetes Mellitus and its Modern Treatment.**—pp. xvi+192. With 6 charts & 1 coloured plate. 1928. Calcutta & Simla: Thacker, Spink & Co. [5s.]

The author of this little book has been the holder of the Mitra Research Scholarship in Diabetes at the School of Tropical Medicine at Calcutta for six years and as he has also had considerable clinical experience of the disease he is well qualified to write about it. His object, he tells us, has been to produce a small handbook dealing with the salient features of diabetes as influenced by conditions of life in India. In this he has been thoroughly successful for in a short compass he gives an admirable account of modern views on the disease and describes fully its treatment. The diet tables drawn up to meet the habits of Indian patients, are particularly useful, and are not to be found in other books and the standard diets which are described in detail should be of great help to the practitioner. Altogether the book reflects credit on the author and on the Calcutta School and should be in the possession of every doctor who practises in India, a country in which diabetes is so common.

Robert Hutchison.

Zuelzer (Margarete). **Die Spirochäten. (Nachtrag).** [The Spirochaetes (Supplement).]—*Handbuch der Pathogenen Protozoen* [von Prowazek (S.) [the late] continued by Nöller (W.).] Lieferung 11. pp. 1627–1798. With 78 text figs. & 2 coloured plates. 1925. Leipzig: Verlag von Johann Ambrosius Barth. [Rm. 12.]

The extremely rapid growth of the literature of this subject in recent years is strikingly shown by the present volume, which is a supplement to Gonder's article on Spirochaetes in the second volume of this Handbook, published in 1920. The more general use of the ultramicroscope is partly responsible for the discovery of large numbers of new forms, including many *Leptospira*, and in addition much attention has been directed to spirochaetes as a result of their importance as disease agents being more generally appreciated. Whether our advances in knowledge are commensurate with the formidable output of publications may be left to the reader's judgment, but the volume under consideration contains good summaries of the sections described and comprehensive lists of references to the literature.

The article begins with a general account of spirochaetes and the author's well-known views as to the essential unity of the structure of spirochaetes, from Ehrenberg's *Spirochaeta plicatilis* down to the smallest *Leptospira*, are fully developed. As a result, she adopts the view, in common with Mesnil and many other authorities, that there is not sufficient justification for the subdivision of the group into different genera and consequently, throughout this work, all forms are referred to the genus *Spirochaeta*.

The second part is divided into three sections, the free-living water spirochaetes, the saprophytic forms occurring in man and animals, and

finally parasitic forms which seem to be definitely pathogenic. Most of the account is concerned with publications which have already been reviewed in this *Bulletin*. The section dealing with saprophytic forms includes a useful table giving a list of all species recorded from animals, together with the hosts, and references to the original descriptions. The section on pathogenic spirochaetes begins with an account of Weil's disease, for the causative organism of which the name *Spirochaeta icterogenes* is adopted. The discussion as to why this name is used instead of the usual *icterohaemorrhagiae* [which has priority], seems rather pointless, as the author supports the view that all pathogenic *Leptospira* belong to one species, and the only reason given for adopting the name *icterogenes* is a doubt as to the serological identity of the German and Japanese forms. (p. 1697).

This is followed by descriptions of seven-day fever (*Spirochaeta hebdomadis*) and of the genital spirochaetosis of rabbits, or rabbit syphilis, (*Spirochaeta pallida* var. *cuniculi*). The article concludes with a section on rat-bite fever which, although caused by a *Spirillum*, is included for convenience in the present volume.

The book is well printed and the illustrations, for the most part, are well chosen and excellently reproduced. Although the importance of work by German investigators is a little over-emphasized in the text, the references given at the end of each section will help the student to obtain a fuller knowledge of the subject : and the article can be thoroughly recommended as a useful addition to the literature of a very difficult group of organisms.

E. Hindle.

Sir Ronald Ross, K.C.B., K.C.M.G., F.R.S., etc. Directeur du Ross Institute de Londres. Prix Nobel 1902. **Une grande page de l'histoire de la médicine. La découverte de la transmission du paludisme par les moustiques.** Préface et traduction de l'anglais par le Dr. Charles Broquet. [Discovery of the Transmission of Malaria by Mosquitoes. Nobel Prize Essay 1902.]—173 pp. With 9 plates & 7 text figs. 1929. Paris : Norbert Maloine, Editeur. [20 francs.]

The " Great Page of History in Medicine " here alluded to is the page on which is written the story of the discovery of the transmission of malaria by the mosquito and the working out of the life cycle of the malaria plasmodia from man to mosquito and mosquito to man. It is a story that is, or should be, well known to all English medical men : but it will bear repeating especially in other languages. This was the work of Sir Ronald Ross, of the Indian Medical Service : begun at the suggestion of Sir Patrick Manson and carried by Ross to a triumphant conclusion, after years of work, in 1898. For many years the mosquito had been suspected and one or two theories were put forward which will be found in this volume. Until Laveran discovered the plasmodium of malaria there was little to guide an investigator. Manson had shown that a mosquito was the intermediate host of *Filaria nocturna* and he suggested to Ross that a mosquito was also the intermediate host of the malarial parasite. From this began Ross' work as set forth in detail, with plates and figures, in the Nobel lecture, delivered at Stockholm in December 1902. It is this lecture which Dr. Broquet has translated. Sir Ronald Ross did not remain satisfied with his discovery alone ; he has always insisted on the practical application of the knowledge obtained to the protection of the inhabitants and the prevention of malaria in the tropics. The Nobel lecture contains several instances of success ; Ismailia, Havana, the Panama Canal Zone, etc. In a long preface of 28 pages Dr. Broquet gives a condensed biography of Sir Ronald Ross and reviews his work in some detail.

J. H. Tull Walsh.

SAVAS (Constantin) [Président de la Ligue] & CARDAMATIS (Jean P.) [Secrétaire de la Ligue]. **Ligue Antimalarienne Hellénique (1905–1928).** [The Antimalaria League of Greece.]—176 pp. 1929. Athens: Imprimerie Française "Le Progres," Rue du Stade, 10.

This interesting document recounts the story of the Antimalaria League of Greece from its modest beginnings in 1905 to the present time. Starting in small proportions and in short measures but with infinite zeal, in the course of seven years it gathered strength and made its influence felt by spreading a vivid knowledge of the real nature of malaria among all classes of the people, by providing special courses of instruction for doctors, by enlisting official help in the distribution of quinine, by securing a modicum of essential financial aid from the State, and by a few modest object lessons in the less costly of modern methods of controlling malaria both in country and in town. But then, alas, began (in 1912) that series of wars wherein Greece was submerged for ten years, during which the growth of the League was stayed and its good work undone.

We learn from the authors that this Antimalaria League was a concept of their own, begotten of CELLI's Italian Antimalaria League—a concept that took corporate shape in a meeting of Athenian notables in the Academy of their city. Although it received royal patronage and other official benediction it seems to have subsisted for some years entirely on subscriptions and casual donations—sums of a thousand or two thousand drachmas (about £40 or £80 respectively)—sums which, when the magnitude of the enterprise in hand is considered, remind one of the private soldier's gibe against the disguised King Henry V. in the play—of going about to turn the sun to ice by fanning in his face with a peacock's feather.

Something of the magnitude of the undertaking was presaged in the emblem adopted by the League—Hercules smiting the Lernean Hydra. For the early investigations of the League disclosed the fact that in all Greece, the area of which, at that time, was 60,000 square kilometres, the tracts occupied by marsh amounted to 88,000 hectares—that is to say, an average of more than 8½ acres of marsh to every square mile of territory. At the same time the burden of malaria bore upon 30 per cent. of the population of the country; of its (then) 445 communes only 29 were exempt from it; and in 76 of them its pressure, in the individual communes, was felt by numbers ranging between 50 and 100 per cent. of the inhabitants. These statistics were collected partly by the provincial doctors, partly by a special commission, and partly by the provincial mayors of whom some were themselves doctors or had doctors in council. In Crete, where of its 20 provinces 9 were free from marsh, and only 4 contained marshes of any considerable extent, the mean incidence of malaria worked out at 16·9 per cent. (Such are the figures, published in 1909, for "Old Greece." Later figures, published in 1924 and 1925, include the extensive additions of territory known as "New Greece"; and show for the "old" provinces a fall in the mean incidence of malaria to 26·82 per cent.)

To cope with this formidable task the League had its subscriptions and its precarious donations with, in the fourth year of its existence, an annual grant from the State of 5,000 drachmas (nom. £203 6s. 6d.). With such limited resources treatment of marshes was out of the question, therefore the League had to concentrate on the methodical employment of quinine and on such minor antimosquito operations as the clearing of obstructed rivulets, springs, pools, etc.

In 1923 the annual government grant was increased to 200,000 drachmas (nominally £8,125), and from that year also the Red Cross Society has contributed 10,000 drachmas annually, besides some minor sums for specific objects. But along with this apparent improvement in the financial position there had come, as a consequence of the country's last disastrous military ambitions, a stupendous influx of a million utterly destitute immigrants, of whom many were infected with malaria and many more were virgin soil

for infection, and it is with that piling of Pelion upon Ossa that the harassed Olympians of the League are finally confronted. Naturally, they would throw themselves entirely upon the State ; and among the suggestions here made for facilitating Government intervention is an appeal to the Rockefeller Foundation. In proposing such an appeal they cannot, of course, remind the world—though the world need not forget—that much of what makes life interesting and significant and beautiful to civilized men is a legacy from Ancient Greece; and therefore it is to be hoped that there are wealthy men in the world—as there have been poets—with an imagination to appreciate this imperishable gift and a natural instinct for the soil from which it sprang.

We have still to notice, though very briefly, since most of it here is a retold tale, some of the antimalaria operations carried out by the League. In the first place, and during three seasons 1907–1909, the campaign in the ever-memorable plain of Marathon, where the entire agricultural population —about 1,680 souls—lay under the incubus of three species of malaria parasites and of three dangerous species of Anopheles mosquitoes. Here the entire population was treated systematically with quinine and the Anopheles larvae were destroyed chiefly by filling or by canalizing the pockets in the bed of their rocky torrents. (2) In Athens also, where the morbidity rate from malarial fevers oscillated between 49·0 and 92·8 per cent. and the principal nurseries for Anopheles were provided by the tortuous torrent Ilissus and its numerous affluents, the same " regulation " of these tortuous torrent beds was effectively carried out as the sole measure. (3) In New Anchialos, where the morbidity rate from malaria was 100 per cent., reliance was justifiably placed on methodical quinization. The measures adopted in the above three places showed that something could be done to restrict the incubus of malaria without attempting the reclamation of marshes.

With the resumption of its activities after the restoration of peace, the League participated in measures for abatement of malaria in Thrace and Macedonia, where the unhappy refugees were settled, and among whom malaria raged widely and with " infernal fury," and often too with tragic mortality ; and later in Epirus, a notoriously marshy province, where the morbidity rate from paludism ranged from district to district between 60 and 90 per cent.

In conclusion it is not superfluous to notice that the authors do not countenance the view that the fall of Greece from her ancient glory was due to introduction of the malaria parasites into the country from elsewhere. On the contrary, they point among other things to the classical descriptions of paludal fevers and their physical associations in the Hippocratic writings as sufficient proof that the Ancient Greeks were always familiar with malaria from the earliest times. They are of opinion that it was in the latter stages of oppression and neglect that the people and country lay supine before the encroachments of malaria ; in short, that the spread of malaria was a consequence, not a cause, of her decline.

A. Alcock.

Manson's Tropical Diseases. A Manual of the Diseases of Warm Climates.—Edited by Philip H. Manson-Bahr, D.S.O., M.A., M.D., D.T.M. & H. Cantab., F.R.C.P.Lond., Physician to the Hospital for Tropical Diseases, London, etc. Ninth Edition, Revised.—pp. xx+921. With 23 colour plates, 12 half-tone plates, 401 figures in the text, 6 maps & 34 charts. 1929. London, Toronto, Melbourne & Sydney : Cassell & Co., Ltd. [31s. 6d.]

It seems hardly necessary to do more than greet the arrival of the ninth edition of " Manson " now in its 32nd year, and no attempt will be made to deal with it in a critical spirit. The Editor's preface tells us that

attention has been specially directed to the subject of treatment and that in some subjects, such as yellow fever, it has been necessary to "remodel previously conceived ideas in the light of recent investigations." Dr. A. L. GREGG has co-operated in a new section on the technique of blood transfusion. There are three new coloured plates and 5 half-tone plates as well as thirty new text figures. The total number of pages is about the same. Doubtless its vogue as a convenient and readable text-book will continue.

A. G. B.

DE LANGEN (C. D.) [Hoogleeraar in de inwendige Geneeskunde aan de Geneeskundige Hoogeschool te Weltevreden] & LICHTENSTEIN (A.) [Officier van Gezondheid 1e klas N.I.L. destijds Leeraar aan de Militaire Cursus voor Tropische ziekten.] **Leerboek der Tropische Geneeskunde.** [Text Book of Tropical Diseases.]—pp. x+636+13. With 5 text figs., 26 plates & 16 figs. on 1 folding plate. 2nd Edition. 1928. Uitgave G. Kolff & Co., Weltevreden, Batavia, Leiden. [30*s.*]

The need for a second edition shows the popularity this book has attained in Holland and in the Dutch East Indies since its appearance a few years ago. It became in fact the most important text-book on tropical diseases in the Dutch language and as it mainly discusses the local conditions of the Malay Archipelago it is invaluable to medical students of the tropical schools in Holland, who intend to work in the Dutch East Indies and to students of the two medical schools in Java. Especially since the medical school in Weltevreden was raised to the standing of an academical faculty the existence of a modern, concise text-book of diseases of the tropics in the Dutch language was very much appreciated. The book contains a great abundance of useful information about the conditions in the Malay Archipelago and it is a pity that owing to its language it remains inaccessible to most foreigners. A translation might perhaps be useful to medical men in the Malay States, where the conditions are similar to those in the Malay Islands.

The second edition shows several alterations and additions and room is found for a short discussion of tropical skin diseases.

H. Lwow.

CONNOR (Frank Powell) [D.S.O., F.R.C.S., D.T.M. & H., Lt.-Colonel I.M.S., Professor of Surgery, Medical College of Bengal, Calcutta & Surgeon to the College Hospital, etc.]. **Surgery in the Tropics.**—pp. ix+293. With 99 illustrations. Churchill's Empire Series. 1929. London: J. & A. Churchill, 40 Gloucester Place, Portman Square. [12s. 6d.]

In his preface the author remarks that some of the surgical procedures described in well-known books on Tropical Medicine are considerably behind the times. He adds that with increasing rapidity of travel, the result of the extension of aerial transport in the near future, the occurrence in temperate climates of diseases once thought to be essentially tropical, will become increasingly frequent, and that a more thorough knowledge of tropical medicine and surgery for all medical students will shortly be necessary. For these and for many other reasons the appearance of Lieut.-Col. Sir F. P. Connor's work will be welcomed. It is the best book of its kind that has yet been published: well-written and well-illustrated, its contents admirably arranged and the author's views clearly expressed. An ordinary knowledge of surgery, surgical pathology and after-treatment on the part of the reader is taken for granted.

In dealing with the various special considerations which enter into a discussion of tropical surgery, allusion is made to the influence of hot temperatures on the effects of general anaesthetics, and the undoubted fact that chloroform is a much safer anaesthetic in India than in England by reason of the lesser density of the vapour produced, more especially when the Junker apparatus is employed. The very necessary warning is given that slight lapses in technique may entail much graver consequences than in cooler climates owing to the greater profusion of bacterial life and the constant presence of the more dangerous anaerobes.

Under *staphylococcic infections* the author mentions the better understanding of glycosuric conditions which has followed upon the discovery of Insulin, often an invaluable aid in the treatment of carbuncle, a dangerous, distressing, and exhausting condition in the tropics. Against *Streptococcic infection* tropical natives seem to possess some degree of natural immunity as compared with European residents either temporary or permanent. In *Plague* injections of Iodine, both intravenous and local, are favoured, this in the writer's experience being the only method of treatment by which a comatose plague patient has ever been saved : until first used by him in such a case in 1911, the sole record of its previous employment by the intravenous method was for the treatment of anthrax in cattle. Under *Leprosy* the curious fact is noted that leprosy lesions can be dragged in the dust, or dressed with the filthiest rags for months or years without anaerobic infection.

Although *Tuberculosis* is one of the commonest diseases in the tropics its different surgical forms are rarer than would be expected, and their superficial varieties seldom encountered. The author is of opinion that the radioactive properties of sunlight probably offer some explanation of this fact.

Mention is made of the enormous incidence of *Syphilis* in the tropics, and the aspects of the disease peculiar to hot countries briefly discussed. Goundou and juxta-articular nodules are included among the tertiary manifestations of *Yaws*, though difference of opinion as regards the first of these conditions is not overlooked.

Illustrative cases are given showing the close simulation by *Malaria* of many surgical conditions, particularly in the abdominal and cerebral areas. In malarial subjects the liability to undue haemorrhage during and after operation must always be borne in mind.

Six chapters are devoted to the surgical aspects of the *Dysenteries*. The need for surgical intervention for the treatment of amoebic bowel lesions has become increasingly small since the introduction of treatment by emetine, but the writer tells us that in very chronic cases he has seen dramatic improvement follow free coecal drainage. Appendicostomy, valvular and open coecostomy, as well as ileostomy associated with valvular coecostomy are considered and are recommended in particular types of cases, the opinion being expressed that too early closing of the surgical opening is a common error, as weeks must elapse after the amoebae have been killed off before the pathological processes due to secondary infection have cleared up. Amoebic abscess of the liver is dealt with at some length, as might be expected, and the fact is stressed that the whole aspect, course and treatment of amoebic hepatitis and abscess have been so radically changed for the better by emetine treatment that only those who practised in the tropics before the introduction of this drug by Sir Leonard Rogers, can realize its revolutionary effect. Aspiration is regarded as the best line of treatment in the majority of cases, but the open operation is recommended under certain definite specified conditions, and the reader is warned that when abscess has formed, those who rely on emetine alone, to the exclusion of surgery, will sooner or later meet with disaster.

The surgical complications of bacillary dysentery, of less importance than those of the amoebic variety, include rectal stricture for which, if persistent, the only effectual treatment is considered to be a temporary colostomy maintained for three to six months. thus giving the bowel complete rest.

Another complication which, when of a severe type, may tax the surgeon's skill to prevent deformity or faulty ankylosis is arthritis.

In some general remarks on *Filariasis* the fact is deplored that of recent years, no real advance has been made in research work on filarial disease, and that its pathology is still obscure. In spite of the millions of human beings infected, the multiplicity of surgical lesions for which the filaria is responsible, and the untold misery thereby produced, enthusiastic workers and liberal funds are not forthcoming as in the case of leprosy. The writer believes, however, that in the near future, some specific remedy, acting like tartar emetic in Bilharzia infections will be discovered. The streptococcus is throughout regarded as the villain of the piece. Funiculitis, a serious and dangerous condition with an undoubted connexion with filarial infection, receives special consideration. In Elephantiasis of the lower extremity experience shows that Kondoleon's operation gives definite relief. In operations for the removal of the elephantoid scrotum a satisfactory method of providing a whole-skin covering for the penis is still to be discovered.

Under *Guinea-worm* attention is drawn to the hitherto insufficiently recognized pathological significance of the remains of calcified worms in the tissues.

An appendix gives some interesting maps and tables showing the geographical distribution of some of the diseases of India.

The book is of convenient size, well printed on good paper with an entire absence of printer's errors. It should be in the hands of all practitioners in the tropics, and will repay study on the part of the surgeon everywhere.

J. J. Pratt.

Baylis (H. A.) [M.A., D.Sc., Assistant Keeper, Department of Zoology, British Museum (Natural History).] **A Manual of Helminthology. Medical and Veterinary.**—pp. xi+303. With 200 text figs. 1929. London : Baillière, Tindall & Cox, 7 & 8, Henrietta Street, Covent, Garden. [30s.]

This volume represents an attempt to bring together, under one cover, some account of the numerous species of worms parasitic in man and the domestic animals. As the author points out in his introduction, to deal exhaustively with even this small part of helminthology would require a work of encyclopaedic dimensions. No attempt has been made to do anything of this nature : on the contrary the author has endeavoured to be as brief and concise as possible, and to provide such short descriptions of the genera and species as it is hoped will suffice, with the aid of illustrations, to enable the reader to determine, at least approximately, most of the parasites he is likely to encounter.

It is true that there are in existence a number of books which contain an account of the helminth parasites of man, and which, to a certain extent, meet the needs of the medical student : but the veterinary student, to whom the subject is of perhaps even greater importance, has to fall back upon works which not only are hopelessly out of date, but are in almost all other respects quite unsuitable for his needs : and those who are called upon to teach helminthology have long been impressed with the urgent need for a text-book adapted to the requirements of the medical and veterinary student.

Although in the view of one who has for many years been engaged in teaching parasitology the present volume is for this purpose not entirely adequate, it is undoubtedly a great advance on anything of the kind yet produced, and both the author and the student are to be congratulated on its appearance.

The author has managed to condense a great mass of information into a volume of very modest dimensions—it is unfortunate that it is not found possible to produce books like this at an equally modest price. An account is given of the Trematode, Cestode and Nematode parasites of man, dog,

cat, pig, cattle, sheep, goat, camel, horse (including donkey and mule), fowl, turkey, guineafowl, duck, goose and pigeon. At the end of the volume there is a list of the parasites found in each of these animals.

The general arrangement of the material is based on the zoological classification of the parasites and the names used are those believed to be most in accordance with a reasonable interpretation of the rules of the "International Commission on Zoological Nomenclature."

To anyone who studies the book, it is at once obvious that it is written primarily from the standpoint of the zoologist. The descriptions of the morphology of the various species are excellent. Little reference, however, is made to the pathology of the subject, and in many cases the life-history of the parasite is dealt with in the briefest possible manner. The question of clinical methods of diagnosis—so important to the medical and veterinary practitioners—does not receive sufficient attention : for example some fifty pages of the book are devoted to the Strongyle parasites and not a single Strongyle egg is figured. Such omissions, which are doubtless the result of a resolute determination to limit the size of the work, unfortunately of necessity lessen its usefulness to the medical and veterinary student.

The work in the reviewer's opinion cannot correctly be described as an introduction to the subject such as could confidently be pressed upon all medical and veterinary students who are entering upon a course of study of helminthology. On the one hand, certain fundamental aspects of the subject, such as technique and methods of preparation of the different types of worm for examination and study, are completely ignored. Moreover, it is very doubtful whether without careful supervision and help the ordinary student could comprehend the introductory matter to each of the sections : this matter would have been greatly simplified by clearly labelled diagrams illustrating the various structures described. On the other hand, in an endeavour to ensure completeness of the work from the zoological point of view, descriptions have been given of large numbers of parasites of merely academic interest to the medical and veterinary student, thus rather tending to over-burden the volume from the text-book point of view.

The various parasites are clearly illustrated by drawings which are at once understood by the expert : but here again the reviewer is compelled to express some doubt whether the absence of explanatory lettering from many of the figures will not render them unintelligible to the ordinary student. There is, however, no doubt that the book is a most valuable production and will prove of the greatest service not only to the senior student, but as a work of reference to the teacher and to all those specially concerned with human or veterinary helminthology.

Warrington Yorke.

Uvarov (B. P.) [Senior Assistant, Imperial Bureau of Entomology.] **Insect Nutrition and Metabolism. A Summary of the Literature.** Prefatory Note by Captain A. F. Hemming, C.B.E., Assistant Secretary, Committee of Civil Research.—Reprinted from *Trans. Entomological Soc. London.* 1928. Dec. 31. pp. 255–343.

Since the bodies of disease-carrying insects constitute the milieu of many organisms pathogenic to man, the study of the chemistry of this environment or in other words of the physiology and biochemistry of insects would seem an obvious line of attack upon the etiology of the diseases in question; and it is surprising that it is only during the last few years that the lack of fundamental knowledge of insect physiology has begun to be felt. The same is true throughout the whole of economic entomology, and it was the realization of this want that prompted the Sub-Committee on Dietetics of the Committee of Civil Research to entrust to Mr. B. P. Uvarov the task of collating all the work which has been published upon the nutrition and metabolism of insects. The result is represented by the paper under review,

which consists of a sixty-five page summary of the literature followed by a bibliography containing nearly six hundred titles. A very just assessment of his paper is given by the author in his introduction where he disarms criticism by pointing out that, being neither a physiologist nor a chemist, his method has throughout been merely summary and not critical. The result is that a perusal of many of the sections gives a highly erroneous impression as to the relative value of the various papers discussed. But, as the author rightly points out, the most valuable section is the bibliography and the paper is to be regarded merely as a guide to this. Used in this way the publication is a very valuable one indeed; for this is the first time that the scattered literature on the subject has been collected, and it will constitute an essential starting point for every worker on this aspect of insect physiology.

The terms nutrition and metabolism are broadly interpreted and besides including work on diet and digestive enzymes there are sections which deal with all the published data on the chemical composition of insects and their products (silk, pigments, cantharidin, etc.), the scanty literature on intermediary metabolism and excretion and the broader questions of the influence of diet on growth and reproduction. The author is undoubtedly right in excluding purely morphological and histological work, for this is readily obtainable from text books, but the worker on the subject will be ill advised to follow this example, for the study of function uncontrolled by histology is prone to be as fallacious as the converse is to be unfruitful.

Essentially "medical" insects figure conspicuously little in this work; but this is not the fault of the author, nor does it detract from its value to the medical zoologist who, whether he be seeking the optimal conditions for the artificial culture of parasitic micro-organisms or the factors which determine the specificity of the insect host, will find here whatever limited data are available upon which to base his work. The avowed intent of the paper is to provoke research and certainly nothing could be more provocative than the numerous and important gaps in knowledge which it displays.

V. B. Wigglesworth.

Brumpt (E.) [Professeur de Parasitologie à la Faculté de Médecine de Paris, Membre de l'Académie de Médecine] & Neveu-Lemaire (M.) [Professeur agrégé, Chef des travaux de Parasitologie à la Faculté de Médecine de Paris.] **Travaux Pratiques de Parasitologie.**—pp. vi+301. With 202 figs. 1929. Masson et Cie., Editeurs Libraires de l'Académie de Médecine, 120, Boulevard Saint-Germain, Paris, VIe. [30 francs.]

This little volume does not profess to survey the whole field of parasitology in relation to disease, although it is a good deal more than a mere introduction to that field, since it includes the parasites of common occurrence and of settled importance in human pathology—just "the parasites that is is most useful to know"—together with their respective intermediaries in the natural environment. It is a guide-book to a course of laboratory-instruction in parasitology and is something more, since besides showing how the parasites of man are to be sought and prepared for study and identification in the laboratory in their pathological aspects, it also imparts the essential facts of the individual life-history in the outside world. To insects 58 pages are given, to ticks and mites 15, to round-worms 26, to trematodes 23, to cestodes 28, to protozoa 43, to the coprological study of eggs of helminths and of intestinal protozoa and their cysts 18, and to the study of blood and its inclusions 10, to fungi 29, and to intermediate hosts 16. Of the 58 pages given to insects 40 are taken up by the flies, the only forms admitted being, Anopheles, Culex, Stegomyia, Phlebotomus, Simulium, Stomoxys, Glossina, and the various Muscid and Oestrid maggots responsible for myiasis in man. A rather surprising omission is Culicoides,

since the midges of that troublesome genus swarm at certain seasons in all parts of the world and inflict a virulent bite, and one species in West Africa has been put upon the list as the intermediary hostess of a parasite (*Filaria perstans*) common enough there. The author's system of study is, with each successive class, or order, or other natural group of parasites, to consider the general provenance and methods of collection, the means and manner of preparation for study, and the general morphology : and then, in the case of each particular parasite, to consider further the morphological detail, the biology and reproduction, and the pathological facts and phenomena. As already indicated, faeces and blood, and the facts and fancies that they present to the trained eye and to the untrained imagination form separate studies. The text is uniformly concise and the descriptive matter is liberally supplemented by excellent figures, only a few of which—among the cestodes chiefly—are the old familiar clichés. As a handbook for the novitiate the little volume is a model of simplicity and conciseness, and but for its definition of a parasite " as a living being that for a part or the whole of its existence lives at the expense of other organized beings "—a definition that includes the whole animal kingdom—it would also be a model of precision.

A. Alcock.

THOMSON (John Gordon) [M.A., M.B., Ch. B., Director, Department of Protozoology, London School of Hygiene and Tropical Medicine] & ROBERTSON (Andrew) [M.B., Ch.B., Lecturer and Milner Research Fellow, Department of Protozoology, London School of Hygiene and Tropical Medicine]. **Protozoology. A Manual for Medical Men.**—pp. xiii+376. With 220 figs. & 4 coloured plates. 1929. London : Baillière, Tindall & Cox, 7 & 8 Henrietta Street, Covent Garden. [30s.]

In this volume the authors have attempted to give a short, succinct, but clear account of the morphology and mode of life of the protozoal parasites which are important as the cause of disease in man, and at the same time, to describe briefly their life histories, on a knowledge of which intelligent preventive measures can be based. As a clear conception of the parasitic nature of an organism cannot be obtained without reference to the tissue and other reactions of the host, an account is given of the pathology of the lesions caused in man by the various organisms.

In the reviewer's opinion, the authors are to be congratulated on having achieved what they set out to do. The book is admirably adapted for the use of students engaged in a course of study of protozoology at one of the schools of Tropical Medicine. It is well written, beautifully illustrated, and contains just what it is necessary for the student to know.

Classification, with its multiplicity of long and difficult names, is reduced to a minimum ; but the fundamental skeleton, which is so essential for an intelligent grasp of the subject, is not only presented in a form readily understood, but since it is based on WENYON'S well-known treatise, has the great value of scientific accuracy.

In addition to an adequate description of the protozoal and spirochaetal parasites of importance to medical and veterinary students, an account is given of certain intracellular and other bodies, the exact nature of which has yet to be determined, e.g., *Anaplasma, Bartonella, Rickettsia*. Sections, useful to students, have also been introduced on such subjects as " Fallacies and Puzzles in Blood Examination " and " Common Objects in Faeces."

At the end of the book there is a valuable chapter on technique, and also a glossary giving the derivations of a considerable number of terms and names commonly used in Protozoology.

Many years of experience in teaching Protozoology to medical and veterinary students have convinced the reviewer of the urgent necessity for

a really suitable text book. He is satisfied that the present volume meets this need. It is written in a manner that can be understood by the ordinary student, and is of such moderate size that it can easily be read by a student taking the tropical medicine course at one of the schools. In short, it is the sort of book that one would expect from men who are experienced teachers.

It seems a pity that it has not been found possible to produce the book at a more modest price. In the reviewer's judgment, many of the photo-micrographs might with advantage have been omitted; a considerable number of them are, in his opinion, of comparatively little educational value and their omission would have served the two-fold purpose of lessening the size of the book and reducing its cost.

W. Yorke.

BUXTON (Patrick A.) [M.R.C.S., D.T.M. & H. Formerly Milner Research Fellow; Director, Department of Medical Entomology; London School of Hygiene & Tropical Medicine.] **Researches in Polynesia and Melanesia. An Account of Investigations in Samoa, Tonga, the Ellice Group, and the New Hebrides, in 1924, 1925. Parts V-VII (Relating to Human Diseases and Welfare).** No 2. of the *Memoir Series of the London School of Hygiene and Tropical Medicine.*—pp. xi + 139. With 7 text figs. & 27 plates. 1928. November. London: School of Hygiene & Tropical Medicine. [9s.]

This memoir constitutes Parts V, VI and VII of "Researches in Polynesia and Melanesia." Parts I–IV were devoted mainly to medical entomology. Part V of the present memoir treats of "Filariasis," Part VI of "Other diseases" and Part VII of "Brown man and white in Samoa." The first thirty-nine pages of the section Filariasis are devoted to considering the relationship between microfilaria infection and filarial disease. They demand close attention, especially on the part of those in whom statistics, however clearly expounded, produce inhibition of the reasoning faculty. The results that emerge from the investigation present interesting matter for reflection and problems for solution.

In regard to technique it is stated that the blood was taken from the lobe of the ear. Further it is recorded that the number of microfilariae in the blood varies from day to day, from hour to hour, and even from moment to moment. Whether these two facts are in any way connected we cannot say, but in haematology the lobe of the ear should be avoided as a source of blood drops. A drop of blood from the ear may frequently give the appearance of "leukaemia" with a large mononuclear count of say 75 per cent., an appearance very different from that of the nth drop, which will probably be normal. In examining for malaria, parasites in the first drop from the ear are at least twice as numerous as those in the second drop, the latter being frequently negative when the former is positive. It is important then to eliminate such a possibility of error as this, and it would seem advisable to conduct further researches on these variations, their extent and the time of their occurrence, and to make control observations on arterial and venous bloods.

Some of the peculiarities of microfilaria infection may be noted :—

(1) Microfilaria is not found in the blood (except rarely) in early childhood (0–5 years) in Oceania.

(2) From 11 years onwards there is no consistent rise in the microfilaria count.

(3) The incidence in females is lower than in males.

(4) In Melanesia the microfilaria is periodic, in Polynesia non-periodic.

Turning now to the signs of filariasis we should bear in mind the author's statement: "that no one has found any satisfactory measure of the

incidence of filarial infection and filariasis in a community." The author finds that :—

(1) The percentage incidence of the physical sign is higher in the men with microfilaria in the blood than in those without it.

(2) The percentage difference is higher for the epitrochlear glands than for the other signs selected (viz., enlarged superior and inferior inguinal glands, epididymis, testis, hydrocele) but we have the additional curious fact that

(3) There is no correlation between the *number* of microfilaria in the circulation and the enlargement of the epitrochlear glands.

Enlarged epitrochlear gland the author considers to be one of the most important signs of filarial infection.

In regard to elephantiasis the following data concerning the relationship of the disease to microfilaria infection appears to emerge from the tables.

(1) Elephantiasis is commoner in those with enlarged epitrochlear glands than in those without.

(2) Enlarged epitrochlear glands are commoner in those *with* microfilaria in the blood.

The tables do not appear to show whether elephantiasis is commoner in those with microfilaria than in those without, but on the other hand ;

(3) In groups with a high microfilaria rate the elephantiasis rate is higher than in those with a low rate.

Again the microfilaria rates for Samoa, the Atolls and New Hebrides are respectively 36, 32 and 31 per cent. and the corresponding elephantiasis rates are 5·6, 6·0 and 6·0. Although the author gives a fairly complete table of his data (table 23) yet it is only a summary one and certain data cannot be extracted from it. We think that all filaria investigators should publish *complete protocols*, for the author himself points out in several places that he has not been unable to use other investigators' results as they have been presented summarily in such and such a way.

However, in regard to elephantiasis we have presumed to manipulate the figures available, and have constructed the following table :—

Age.	Population.	Microfilaria cases.	Elephantiasis cases.	Microfilaria rate.	Elephantiasis rate.
0–20	470	106	0	22·5	0
21–25	110	44	2	40	1·8
26–35	208	103	10	49	4·8
36–45	187	84	24	45	12·8
46 up.	128	61	26	47	20·0
	1,113		62		5·6

This result is perhaps not inconsistent with that under heading (3) above ; but at any rate it appears to show that while the microfilaria rate remains constant, the elephantiasis rate approximately doubles itself in each decade.

Myositis (muscle abscess as distinct from gland abscess) occasions much chronic ill-health in Samoa. The author after a critical consideration of the facts, collected by him, decides against any connexion with filariasis. We have already indicated the author's views based on a close examination of the data that enlarged epitrochlear glands are one of the best signs of filarial infection. In leaving this subject we can only re-echo the view expressed by the author, on the first page of the memoir, viz., " that the pathology of filariasis is one of the most complex and least understood of the problems of tropical medicine " but congratulate him on having brought forward " fresh and definite evidence " that " infection with Filaria is an essential precursor to the development of tropical elephantiasis." Those whose thirst for knowledge on these subjects has been temporarily " assuaged " by a study of Part V may be recommended to turn to Part VII

where they will find much of interest, a welcome relief after the rigours of Part V.

In a word the author has done an excellent piece of work. The memoir is illustrated by exceptionally good plates, but one wishes it had been possible to avoid " glazed " paper for the printed page.

J. W. W. Stephens.

CALCUTTA. **Annual Report of the Calcutta School of Tropical Medicine, Institute of Hygiene and the Carmichael Hospital for Tropical Diseases. 1928** [ACTON (H. W.), Director.]—103 pp. With 3 plates & 1 chart. 1929. Calcutta : Bengal Govt. Press.

Since the report for 1927 was reviewed—this *Bulletin,* Vol. 25, p. 755—there have been slight changes in the staff. Lt. Col. H. W. ACTON has succeeded Colonel MEGAW (now officiating Surgeon-General of Madras) and Dr. R. T. M. HAYTER becomes Assistant Director in place of Major BAPTIST who has retired. A great loss to the school was suffered by the death of Sir David YULE, always a great friend, helping not only with his own money but by persuading other influential persons to help when help was most needed. Lack of funds still makes it necessary for some of the staff to teach more than one subject, e.g., the Director is Professor of Bacteriology, Pathology and Helminthology. Finance will be further reduced when the Research Institute at Dehra Dun is established since Rs.82,000 now received from the Indian Research Fund Association will be mostly given to the new Institute. The School is for research and post-graduate teaching only and patients are only admitted to the attached Hospital if considered suitable by the School staff. There are plenty of hospitals in Calcutta for emergency and other cases. There is a large Out-Patient Department. We cannot enter fully into the various reports sent in by the teachers. This report is marked " For official use only " but much of the important work recorded has been published either in book form or in certain medical journals, the *Indian Medical Gazette* and the *Indian Journal of Medical Research.* There is a long list of such books and papers at the end of the Report. An interesting piece of work in which the professors of Pharmacology and Chemistry have collaborated concerns the alkaloids of " Kurchi ", *Holarrhena antidysenterica.* They have proved useful in amoebic dysentery. These alkaloids are well tolerated intra-muscularly and do not depress the heart or cause nausea and the cost of production is less than one-tenth that of emetine. Next to the reports by Professors come reports from the various research departments. These were enumerated in the review of the 1927 report. The report contains in a separate chapter statistics of the number of patients who attended the Pasteur Institute, 1924–1928, for anti-rabies treatment. Among the list of animals recorded as causing bites we find Cow (4), Man (9).

J. H. Tull Walsh.